

ANIMAL KEEPERS' FORUM

The Journal of The American Association of Zoo Keepers, Inc.



March 2009

Vol. 36, No. 3

AKF Managing Editor: Susan D. Chan • **Associate Editors:** Becky Richendollar, North Carolina Zoo • Mark de Denus, Winnipeg, MB • **Enrichment Options Column Coordinator:** Rachel Daneault, Disney's Animal Kingdom • **Legislative/Conservation Outlook Column Co-Coordinators:** Becky Richendollar, North Carolina Zoo and Greg McKinney, Philadelphia, PA • **Reactions Column Coordinator:** William K. Baker, Jr., Abilene Zoo, Abilene, TX • **ATC Column Co-Coordinators:** Angela Binney, Disney's Animal Kingdom; Kim Kezer, Zoo New England; Jay Pratte, Zoo Atlanta • **Conservation Station Co-Coordinators:** Penny Jolly, Greater Orlando AAZK Chapter and Amanda Kamradt, Greater Houston Chapter of AAZK • **Proofreader:** Barbara Manspeaker, AAZK Administrative Office.

Animal Keepers' Forum is published monthly by the American Association of Zoo Keepers, Inc., 3601 S.W. 29th Street, Suite 133, Topeka, KS 66614-2054. Ten dollars of each membership fee goes toward the annual publication costs of Animal Keepers' Forum. Postage paid at Topeka, KS.

AAZK Executive Director: Ed Hansen, AAZK, Inc., Topeka KS

also serves as AAZK Liaison to the American Zoo & Aquarium Association (AZA)

AAZK Administrative Secretary: Barbara Manspeaker, AAZK, Inc., Topeka, KS

BOARD OF DIRECTORS

Shane Good, Cleveland Metroparks Zoo, Cleveland, OH 44109

President

Denise Wagner, The Phoenix Zoo, Phoenix, AZ 85008

Vice President

Jacque Blessington, Kansas City Zoo, Kansas City, MO 64132-4200

Tammy Root, Indianapolis Zoo, Indianapolis, IN 46222

Bob Cisneros, San Diego Zoo, San Diego, CA 92112-0551

COMMITTEES/COORDINATORS

By-laws

Chair - Gisela A. Wiggins, North Carolina Zoo

Grants Committee

Chair - Shelly Roach, Columbus Zoo

Behavioral Husbandry Committee

Chair - Deana Waltz, Tracy Aviary

Annual Conferences

Coordinator - Ed Hansen, AAZK, Inc.

ICZ Coordinators

Shane Good, Cleveland Metroparks Zoo
and Norah Farnham, Woodland Park Zoo

Bowling for Rhinos

Coordinator - Patty Pearthree, Cary, NC

Ethics

Chair - Denise Wagner, The Phoenix Zoo

Awards

Chair - Janet McCoy, The Oregon Zoo

Marketing Resources

vacant

Professional Development

Melaina Wallace, Disney's Animal Kingdom

Conservation Committee Co-Chairs

Amanda Kamradt, Greater Houston Chapter
and Penny Jolly, Greater Orlando Chapter

MEMBERSHIP SERVICES

Data Transfer Forms

Available for download at www.aazk.org

AAZK Website - Liaison to Webmaster

Denise Wagner, The Phoenix Zoo

AAZK Historian

Mark Levin, Plymouth Meeting, PA

AAZK Publications/Logo Products

AAZK Administrative Offices/Topeka

Table of Contents

About the Cover/Information for Contributors.....	90
Scoops & Scuttlebutt.....	91
From the Executive Director.....	92
ICZ/AAZK 2009 - Conference Update.....	93
Coming Events.....	94
AAZK Announces New Members.....	96
Renewing Membership with PayPal® - a few reminders.....	96
Training Tales (<i>Putting Baiting in Focus</i>).....	97 - 100
Notes on Managemennt of DeBrazza's Monkey Group with Diabetic Individual and Intra-specific Aggression.....	101 - 105
Reactions Column (<i>Dangerous Animal Escape Drills</i>).....	106 - 108
Searching for Your Support - GoodSearch.com.....	108
Simultaneous Training of 1.0 <i>Equus grevyi</i> and 0.1 <i>Homo sapiens</i>	109 - 113
Restraint of Przewalski's Horses for Reproductive Studies at the National Zoo's Conservation & Research Center, Front Royal, VA.....	114 - 118
Enrichment Options (<i>Call for Submissions</i>).....	119 - 120
Monterey Bay Aquarium Helps You Pick the Right Sushi.....	121 - 122
Book Reviews (<i>Turtles of the Southwest</i> and <i>Gators, Gourheads and Pufflings:</i> <i>a biologist slogs, climbs, and wings her way to save wildlife</i>).....	123
Conservation/Legislative Update.....	124 - 132



35th Anniversary - 1974 - 2009

MISSION STATEMENT

(Revised November 2008)

American Association of Zoo Keepers, Inc.

The mission of the American Association of Zoo Keepers, Inc. is to advance excellence in the zookeeping profession, foster effective communication beneficial to animal care, support deserving conservation projects, and promote the preservation of our natural resources and animal life.

This month's cover features a drawing of a pair of African Lions (*Panthera leo*) drawn by Kim Lovich of the Curator's Department at the Zoological Society of San Diego. Lions are the only cats that live in groups, which are called prides. Prides are family units that may include up to three males, a dozen or so females, and their young. All of a pride's lionesses are related, and female cubs typically stay with the group as they mature. Young males eventually leave and establish their own prides by taking over a group headed by another male. Only male lions boast manes, lions are sexually dimorphic. Males defend the pride's territory, which may include some 100 square miles (259 square kilometers) of grasslands, scrub, or open woodlands. Female lions are the pride's primary hunters. They often work together to prey upon antelopes, zebras, wildebeest, and other large animals of the open grasslands. Many of these animals are faster than lions, so teamwork pays off. After the hunt, the group effort often degenerates to squabbling over the sharing of the kill, with cubs at the bottom of the pecking order. Young lions do not help to hunt until they are about a year old. Lions will hunt alone if the opportunity presents itself, and they also steal kills from hyenas or wild dogs. Lions have been celebrated throughout history for their courage and strength and have been called the King of the Beasts. They once roamed most of Africa and parts of Asia and Europe. Today they are found only in parts of sub-Saharan Africa, except for one very small population of Asian lions that survives in India's Gir Forest. The lion population in Africa has been reduced by half since the early 1950s. Today, fewer than 21,000 remain in all of Africa. The Gir Wildlife Sanctuary in India contains approximately 200 lions. Interesting Lion Facts: Top speed 50 mph, for short distances; Longest leap - 36 feet; Distance over which roar can be heard - 5 miles/both males and females roar; Height 4 feet (males), females smaller; Length 5-8 feet (males), females smaller; Weight 330-500 lbs (males), females less; Lifespan 13 years, although they may live longer in captivity. Thanks, Kim!

Articles sent to *Animal Keepers' Forum* will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for *AKF*. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone, fax or email contributions of late-breaking news or last-minute insertions are accepted as space allows. Phone 785-273-9149; FAX (785) 273-1980; email is akfeditor@zk.kscoxmail.com If you have questions about submission guidelines, please contact the Editor.

Deadline for each regular issue is the 10th of the preceding month.

Dedicated issues may have separate deadline dates and will be noted by the editor.

Articles printed do not necessarily reflect the opinions of the *AKF* staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. If an article is shown to be separately copyrighted by the author(s), then permission must be sought from the author(s). Reprints of material appearing in this journal may be ordered from the editor. Regular back issues are available for \$4.00 each. Special issues may cost more.

E-Mail Addresses:

You may reach Barbara Manspeaker at AAZK Administrative Offices at: aazkoffice@zk.kscoxmail.com

You may reach Susan Chan and *Animal Keepers' Forum* at: akfeditor@zk.kscoxmail.com

Mailing Address:

AAZK, Inc., 3601 SW 29th St., Suite 133, Topeka, KS 66614-2054

AAZK website Address: www.aazk.org

BFR Website: <http://aazkbfr.org>

Scoops & Scuttlebutt



Announcement from the Editor

We have received an amazing number of articles dealing with the care of aging zoo animals for the dedicated issue on Geriatric Zoo Animals initially planned for the April 2009 edition of *Animal Keepers' Forum*. Because we feel it is important to have all of this information together in a single issue, we will be combining the April and May issues of *AKF*. What this means is that, as members, you will be receiving this special issue in late April or early May. We think you will find the articles and case studies fascinating and also will be able to glean much useful information on caring for aging zoo animals that you may have in your own zoo's collection.

If you have fellow keepers at your facility who are **not** AAZK members, encourage them to join by April 1st in order to receive this expanded issue as a part of their membership. After the initial mailing to current members, additional copies of this topic-specific issue will be sold as a separate publication similar to the issues on Cheetah, the Polar Bear and Crisis Management in Zoos have been in the past.

I would like to thank all of those zoo professionals who have taken the time and effort to contribute articles for this dedicated issue. It looks to be something very special indeed.

Corrections to Note

Please note the following corrections to the article "Orangutans and Gorillas - The Great Apes' Exhibit News from Japan" by Kako Y. Yonetani published in the February 2009 *AKF*, pgs. 73-75:

1. It was reported that Gypsy, at age 52, was the oldest orangutan in any Japanese Zoo. However, the author reports that Morie, estimated age 57, is actually the oldest. Morie, a Bornean orangutan, resides at the Tama Zoo having been transferred from the Ueno Zoo in 2005. Gypsy, the Bornean orangutan pictured on page 75 of the February issue, came to the Tama Zoo in 1958. The Tama Zoo celebrated its 50th anniversary in 2008.

2. Oki, shown on page 75 as the oldest western lowland gorilla in Japan is 54 years old this year.

3. Tama Zoo is not, as reported, the oldest zoo in Japan. The Ueno Zoo in Tokyo is that country's oldest zoological facility.

4. Apparently, the trio of gorillas at the Higashiyama Zoo & Botanical Garden in Nagoya did not perform the rope walking trick as reported, but did display other tricks and behaviors.

It is always challenging to translate material sent in by an author whose first language is not English. I apologize for any errors that may have appeared due to my misinterpretation of the submitted material.

Preserving History - Seeking Photos

AAZK is compiling a photographic library of the history of the organization. The Association is looking for photos from AAZK National Conferences and local Chapter events. We will be selecting some of these photos to post on the Historian section of the AAZK website. Please provide a brief description of the event including, as a minimum, when and where it was taken and, if known, who is in the photo. As Historian, Mark Levin will be gathering and organizing these photos. Please send electronic photos to him at jaguarkpr@mac.com. They should be high resolution and in either jpg or tif format. If you wish to send a printed copy of the photo please mail it to him at: 3038 Arrow Head Ln., Plymouth Meeting, PA 19462. All photos must be accompanied by a Photo Release Form available to download on the AAZK website. You may submit the form electronically to Mark or print it out, obtain the required signatures, and mail it to: Susan Chan, AAZK, Inc., 3601 S. W. 29th St., Suite 133, Topeka, KS 66614-2054 Attn: Photo Release

AAZK, Inc. does not pay for photographs, but will give appropriate credit to individual photographers and/or institutions whenever a photo is utilized.

From the Executive Director. . . .

We're giving money away.

In this financial climate, that statement should be enough to grab your attention, but if it's not, let me explain.

AAZK has numerous award categories. Three of these categories come with a cash award, generously endowed by the Lutz Ruhe Educational Trust and the Mazuri® Foods Division, which is given directly to the winner. Here's the list:

- Lutz Ruhe Meritorious Achievement Award – AAZK Professional of the Year (\$750.00)
- Jean Hromodka Excellence in Animal Care Award (\$500)
- Mazuri® Animal Nutrition Award (\$500)

These are distinguished awards that recognize accomplishments in a profession where accolades, especially those associated with a monetary reward, are almost impossible to find. The primary intent of the award is to assist the winner in funding their expenses to the annual AAZK National Conference, where they are recognized in front of their peers. But if the individual cannot attend the AAZK Conference – the cash award is still conveyed.

Unbelievably, these awards consistently go unclaimed, without nomination. I do not believe there has been one year where all three awards have been conveyed.

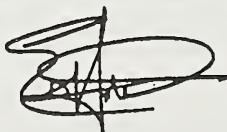
Here is the link to the AAZK webpage:

http://www.aazk.org/committees/comm_award.php

Visit the Awards Committee section and take a look at the award criteria. Nominate a co-worker for the recognition they deserve, or talk your co-worker into nominating you! Maybe it's time you get the recognition that maybe has been passing you by.



My job is to ask you for money. It's not often I can turn the tables around and try to give money back to the membership. Help yourself.



Ed Hansen
Executive Director



“One World, One Zoo”

The 3rd International Congress on Zoo Keeping and the 36th American Association of Zookeepers National Conference will be held in Seattle September 24th thru 29th 2009. Hosted by the Puget Sound Chapter of AAZK and Woodland Park Zoo. This is the first joint conference of ICZ and AAZK and the first time ICZ has ever been hosted in the U.S. We are estimating an attendance of 350-400 people from the U.S. and 30 different countries!

- Registration is now open! Please visit www.pugetsoundaazk.org for registration instructions and more conference information. **All** registration must be done online.
- You are invited to submit abstract of paper, posters, and workshops.

Deadline for abstracts is 1st April 2009

For more information and guidelines visit www.iczoo.org

- **Keynote Speaker:**

Gordon McGregor Reid, Director General Chester Zoo and WAZA President.

- **Guest Speakers:**

Sally Walker, President of Zoo Outreach Organization and Dr. Tom McCarthy, Managing Director of Field Programs, Snow Leopard Trust

We look forward to seeing you this year in Seattle!

~ Peter McLane - PSAAZK Chapter Liaison

Animal Keepers' Forum, Vol. 36, No. 3 93

Coming Events

Post Your Coming Events Here
email to: akfeditor@zk.kscoxmail.com

International Cassowary Summit - April 1-4, 2009 in Cairns, Queensland, Australia. The Australian Rainforest Foundation (ARF) invites you to the inaugural International Cassowary Summit held in the heart of the World Heritage listed West Tropics in tropical northern Queensland. The conference is focused on bringing together scientists, researchers, zoo curators, natural resource management and environmental groups to formalize how we must act and in what timeframe to ensure the survival of this keystone rainforest species. Workshops, plenary sessions and field trips will address a Recovery Plan for the cassowary, the current state of research, captive breeding, habitat analysis and threats, and potential wild releases. For more info email: info@arf.net.au

AZAD 2009 Regional Conference - April 24-26 in Phoenix, AZ. Hosted by the Phoenix Zoo. For further info contact Mary Anne Lefevre at mlfevre2@cox.net or Randi Knappenberger at bkandran@mac.com

2009 Animal Behavior Management Alliance (ABMA) Conference - April 26 - May 1, 2009 in Providence-Warwick, RI at the Crowne Plaza Hotel. The theme is "Bridging the Gap" - bringing together trainers, handlers, and keepers of animals, irrespective of species to share information and address topics to help develop a comprehensive behavior management program. Does your behavior management program need a little spicing up? Join us to learn new techniques on how to connect with the animals in your care; including interactive training and enrichment workshops; and the importance of evaluating and documenting your behavior management program. All conference details, including the 1st Call for Papers, are available at www.theabma.org Send inquiries to Penny Krebs at pennkrebs@cox.net or to Jen Hennessy at jhennessy@rwpzoo.org

ASZK Annual Conference - April 30 - May 3, 2009 in Darwin, Northern Territory, Australia. For more information go to www.aszk.org.au or email eo@aszk.org.au

Prosimian Husbandry Workshop - April 30- May 2, 2009. Hosted by the Cleveland Metroparks Zoo. The workshop will emphasize group discussion of captive prosimian husbandry and management issues. Look for registration, lodging, and workshop information at the workshop web-page, www.clemetzoo.com/prosimianworkshop <

2009 Rhino Keeper Workshop - May 17-21, 2009 at Busch Gardens, Tampa, FL. Please watch website www.rhinokeepersassociation.org for updates regarding the workshop. Any inquiries may be directed to: internationalrhinokeepersassociation@gmail.com

The 4th Annual Animal Keepers of Africa (AKAA) Symposium - May 18-21, 2009. Go to www.uweczo.org or www.akafrica.com for details.

International Conference on Diseases of Zoo and Wild Animals 2009 - May 20-24, 2009 at Safaripark Beekse Bergen, Hilvarenbeek, The Netherlands. For information contact: 2009@zoovet-conference.org or see <http://www.zoovet-conference.org>

The 9th International Conference on Environmental Enrichment - May 31 - June 5, 2009 in Torquay, Devon, UK. **First Call for Papers** and registration--go to www.reec.info for details.

Third Orangutan SSP® Husbandry Workshop - August 31 - September 2, 2009 hosted by Zoo Atlanta, Atlanta, GA. This workshop will focus on the care and management of the orangutan in captivity. The workshop will bring together orangutan caregivers, managers, researchers, and field biologists to share and disseminate the most current information on husbandry, conservation, and emergent issues pertaining to captive and wild populations of orangutans. For more information please visit our website at www.2009orangutanworkshop.org or contact Tom Heitz at theitz@zooatlanta.org or call 404-624-5939.

AZA Annual Conference - September 12-18, 2009 in Portland, OR. For more information see www.aza.org

26th EAZA Annual Conference - September 14-20, 2009 in Copenhagen, Denmark.

Joint 36th National AAZK and 3rd International Congress on Zookeeping Conference - September 24-29, 2009 in Seattle, WA. Hosted by the Woodland Park Zoo and the Puget Sound Chapter of AAZK. Check out www.pugetsoundaazk.org/ for conference information.

FINAL Call for Papers: You are invited to submit abstracts of papers, posters & workshops on any aspect of zoo work. More information and guidelines can be found at the ICZ website www.iczoo.org If you want to run a workshop focused on developing zoo keeper skills, please send a short description. Please mark 'ICZ Abstract' and send to: Paul Howse, ICZ Steering Committee at p.howse@chesterzoo.org **Deadline for abstracts is 1 April 2009.**

64th WAZA Annual Conference - October 4-8, 2009 in St. Louis, MO. Hosted by the St. Louis Zoo at the Renaissance Grand Hotel. For more information please visit <http://www.waza.org>

Neotropical Primate Husbandry, Research, and Conservation Conference - October 13-15, 2009 in Chicago, IL. Hosted by the Brookfield Zoo. This conference will focus on a variety of topics pertaining to neotropical primates and will bring together staff from zoological parks, sanctuaries, and universities, as well as field researchers and range country biologists to share the most current information on husbandry, and conservation. Please contact vince.sodaro@czs.org for additional information.

20th International Zoo Educators' (IZE) Biennial Conference - October 19-23, 2009 at Disney's Animal Kingdom, Orlando, FL. For more information, please visit <http://www.izea.net>

7th International Penguin Conference - August 30 - September 3, 2010 in Boston, MA. Hosted by The New England Aquarium. For info email ipcboston@neaq.org



DIETS AS DIVERSE AS THE ANIMAL KINGDOM

Working in partnership with zoos and aquariums, MAZURI® PhD nutritionists develop industry leading products specifically for each species. From aardvarks to zebras, we work hard to give your animals the most of what they need.

For more information on MAZURI® products—including nutritional analyses and research findings—visit www.mazuri.com

or call 1-800-227-8941 for the location of your nearest dealer. Because when it comes to great nutrition, we're committed to the health and longevity of every animal.

Mazuri®
The Exotic Animal Feeding Resource

www.mazuri.com

AAZK Announces New Members

New Professional Members

Conrad Teufel, **Rosamond Gifford Zoo at Burnet Park (NY)**; Sara Koplish, **Lehigh Valley Zoo (PA)**; Paula Blair, **Maryland Zoo in Baltimore (MD)**; Emily Maple, **Palm Beach Zoo (FL)**; Rebecca Phillips and Alyson Kristie, **Busch Gardens (FL)**; Jessica Easterday, **Nashville Zoo at Grassmere (TN)**; Shannon Scanlan, **North Eastern Wisconsin Zoo (WI)**; Amy Peterson, **Lincoln Park Zoo (IL)**; Lisa Hoza, **Glen Oak Zoo (IL)**; Sheila Crosby, **Scovill Zoo (IL)**; Joe Remington and Brandon Greaves, **Omaha's Henry Doorly Zoo (NE)**; Sonny Kazen, **Houston Zoo (TX)**; Jeff Stehle, Sal Scibetta, Mike Huff, Angela Martell and Kathryn Biesenbach, **San Antonio Zoo (TX)**; Katherine Molifino and Thomas Munger, **The Living Desert (CA)**; Jason Loy, **Oakland Zoo (CA)**; Marla Tuillio, **Seattle Aquarium (WA)**; Ayase Grant, **Mountainview Conservation Center (BC, Canada)**. *(We no longer print the names of those Professional members who do not list their facility on their membership application/renewal. There are nine this month)*

New Institutional Members

Cub Creek Science Camp
Rolla, MO

Renewing Institutional Members

Binghamton Zoo at Ross Park, Binghamton, NY
Michael Janis, Director

Lion Country Safari, Inc. FL, Loxahatchee, FL

Milwaukee County Zoo, Milwaukee, WI
Chuck Wikenhauser, Director

Henry Vilas Zoo, Madison, WI

Ellen Trout Zoo, Lufkin, TX
Gordon Henley, Director

International Exotic Feline Sanctuary, Boyd, TX
Richard Gilbreth, Director

Tautphaus Park Zoo, Idaho Falls, ID
William R. Gersonde, Superintendent

California Wolf Center
Julian Center for Science, Julian, CA

Wild Wonders, Inc., Bonsall, CA
Jackie Navarro, Executive Director

New Commercial Member

ABC Training Systems
Freeland, MD

Renewing Commercial Member

Mazuri Diets/Purina Mills, St. Louis, MO
Dr. Mark Griffin

Renewing Membership with PayPal®


A Few Reminders

If you join or renew your membership in AAZK on the website (www.aazk.org) and use PayPal® as your method of payment, please be aware of the following:

- The information we receive at our office via email confirmation from PayPal® only lists the name on the credit card being used for payment. Therefore, the AAZK membership card we issue will be in that name. So, if you use a credit card other than one in your own name (spouse's, parent's, or friend's,), you need to email Barbara Manspeaker at aazkoffice@zk.kscoxmail.com letting her know that a PayPal® payment for your membership is coming in, but the PayPal® email confirmation will be under another individual's name.

- Also, the information AAZK's receives from PayPal® does not tell us the zoo or aquarium with which you are affiliated. When you pay via PayPal®, we ask that you email Barbara with your institutional information so that your listing on our membership database may be as complete as possible.

- If there are any problems with or questions about a membership submitted via PayPal®, Barbara will be sending an email to whatever email address you have listed on your PayPal® account settings. If this is not an email address you check regularly, you may not receive such an email and this could cause delays in processing your membership.



**THE
GOURMET
RODENT,
INC.™**

VISA MasterCard Discover

RATS AND MICE

Bill & Marcia Brant

12921 SW 1st Rd., Ste 107,
PBM #434
Jonesville, FL 32669

(352) 472-9189
Fax: (352) 472-9192
e-mail: GrmtRodent@aol.com

The AAZK Behavioral Husbandry Committee Presents

Training Tales...



Where you can share your training experiences!

*Training Tales Editors – Jay Pratte, Zoo Atlanta; Kim Kezer, Zoo New England;
and Angela Binney, Disney's Animal Kingdom*

Putting Baiting in Focus

By

*Jonathan Miot, Lead Keeper – Carnivores, Lincoln Park Zoo
AAZK Behavioral Husbandry Committee Member*



A pallas cat is baited onto a scale platform
(Photo courtesy of Lincoln Park Zoo)

We have all been there before – your animal is doing that cute thing that she does and you want to document it for your co-workers. So you take out your cell phone and snap a small grainy picture of her. You show everyone at lunch. They all ooh and ahh, but the picture goes no further. The cell phone camera served its purpose then, but when you take your trip to Africa you wouldn't dream of relying on the cell phone as your sole means of documenting the journey. Each type of camera is a tool which fulfills a specific purpose. Baiting works in much the same way, it is just another tool in your training arsenal, useful in certain circumstances, but not appropriate for all scenarios.

Baiting or luring is showing, or making an animal aware of, the reinforcement which is available to it before the behavior takes place. The most common "bait" is food, but it can be done with any type of

reinforcement. Baiting is one approach to encouraging a behavior to occur in order to reinforce it during the training process. Baiting motivates an animal to create an action that causes the behavior to occur, at which point the behavior can then be reinforced and eventually paired with a discriminative stimulus or behavior cue.

There are situations where baiting can be used effectively, but you need to be very careful about how, when and why these are used.

Examples of circumstances where baiting may be used:

- An Animal which has no history of reinforcement, or a very poor history of reinforcement, with the desired behavior (e.g.: the very first time the animal is in a training scenario)
- Training a behavior which will only occur once – i.e. crating or shipping an animal
- An immediate need for the behavior – no time to train the progression
- Gross movement behaviors – Shifting, Turning, Backing up
- Stationing behaviors – scale

Why does it work?

Your reinforcement or bait stimulates the behavior. If the animal values that reinforcement, he will initiate movement. Additionally, a naive animal that does not realize participation will yield reinforcement may quickly learn the value of that participation.

So what is the challenge with baiting?

The most common baiting mistake is relying on it for too long. Once the baiting has caused the desired behavior to occur you should immediately begin to capture and shape that behavior using operant conditioning techniques. When baiting is used as the only method to train a behavior, a number of problems can occur. This may cause you to rethink your approach. Also, if you are baiting and not delivering the “bait” you are simply tricking the animal. This will quickly lead to a breakdown in your relationship, and a total lack of participation on the animal’s part.

Why is baiting not appropriate for long term use?

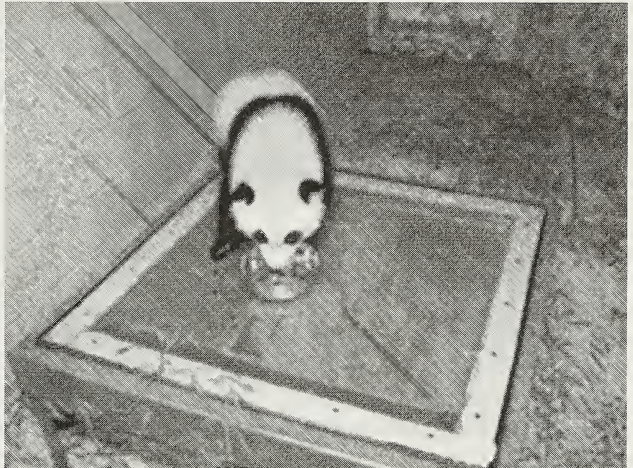
- If the animal does not want the reinforcement, he can choose not to participate based solely on the quality, magnitude, or type of reinforcement.
- If more bait is added, this can actually train the animal to hold out to see what else it can elicit from the trainer (waiting for bigger and better options).
- Over time, you may need to increase reinforcement criteria in order to attain the same results.
- The behavior will always be contingent upon the bait. If you don’t have or can’t use the bait at some point in the future, then you will not be able to elicit the behavior.
- Baiting is contrary to traditional operant conditioning that uses Antecedent – Behavior – Consequence (or ‘cue-behavior-reward’) as a training sequence. When you use baiting, the consequence (reinforcement) is offered before the behavior and sometimes even before (or in place of) the antecedent (cue). This will create a reliance on the reinforcer, instead of on a conditioned response to behavioral cues.
- At best you are reinforcing a superstitious behavior; at worst you are reinforcing an undesired behavior.
- Using baiting accomplishes the task, but the animal may not learn the task, he may have been too focused on the bait to realize what he was doing.
- You should always be thinking about the long term end result. Baiting is strictly a short term training tool, and should not be used as a discriminative stimulus or cue.

Examples of when to not use baiting:

- When a behavioral breakdown is occurring on an already established behavior. Instead, go back to an earlier step in the shaping plan – reinforce a quality response, then continue to progress back up to your previous level
- In lieu of an established behavior, like target, follow, or come. Use the other tools in your training toolbox before resorting to baiting. They are there for a reason.
- Once you have used baiting to establish a behavior – continuing to bait will only inhibit long term successful progression of this behavior.

You chose baiting, so now what?

How do you transition from baiting to operant conditioning techniques? First realize that you are using baiting. Some baiting is inconsequential or will be practically impossible to remove. If you show up to a training session with food, which the animal can see, smell or otherwise sense, then you are baiting. Is it worth it to remove detection of that food? If you are otherwise using sound operant conditioning techniques, such as variable schedules of reinforcement and varied reinforcers then probably not. Placing food in a stall before an animal shifts inside is baiting. Is it worth it to remove this baiting? Is there ever going to be a time when you need to shift that animal without food present? Is it otherwise difficult or unsafe to deliver that food? You may need to balance several factors before determining your course of action.

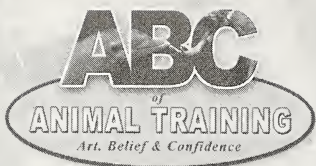


Baiting can work well for a food motivated animal, such as this giant panda at Zoo Atlanta. (Photo courtesy of Jay Pratte)

Once you realize that you are using baiting ask yourself if you want baiting to be a permanent part of the finished behavior. If not, take immediate steps to change the behavior. While you are baiting notice which other cues you are exhibiting; hand movements, door movements, or verbal cues. You may

have inadvertently associated a cue with the delivery of food and the subsequent behavior; you can now use that association to shape the behavior. Instead of giving the food to elicit the behavior, offer these cues just before offering the reinforcement. Wait for a small approximation of the behavior to be offered; bridge the behavior (if the bridge is established) and reinforce. Continue the process so the cue is offered, the entire behavior is solicited, and ultimately the reinforcement is delivered.

When training shifting behaviors use a similar process: wait for the animal to take a step in the desired direction, or if you have a particularly difficult case, even just make eye contact, and then apply the reinforcement to that particular step. In this way you can quickly transition from a baiting based relationship to a more traditional operant relationship. If you are baiting to encourage a stationing behavior, you should gradually reduce the amount of food waiting at the station. Reinforce



DOLPHIN TRAINER ACADEMY

abcanimaltraining.com

**Basic Academy
Sept. 14 - 18, 2009**

**Advanced Academy
Sept. 21 - 25, 2009**

ENROLL TODAY! SPACES ARE LIMITED!

him after the animal is at station. Eventually the animal will go to the station without any bait. Now you can gradually extend the amount of time he waits calmly at the station before receiving reinforcement.

By using operant condition you are creating a method of communication between the trainer and the animal being trained. This communication creates a strong relationship which should be the focus of training. When you use baiting you are changing the relationship from one based on communication and trust to one simply focused on the bait. Ultimately, baiting is just another tool which you can use to encourage behavior, but just like a camera it is only as good as the operator. Before you begin training have a clear picture of the end result. If the picture is built around a solid relationship and sound training techniques it will be one which can be viewed for a long time.

Training Tales...



*Where you can share your
training experiences!*

Just a reminder, submit your "Training Tales" and experiences in operant conditioning to share with *Animal Keepers' Forum* readers. This opportunity provides a convenient outlet for you to exhibit your training challenges, methods and milestones with the AAZK member network. Please submit entries based on the following guidelines:

- a) *Submit a brief description of a training project at your zoo (500 words or less, in text or bullet points). Details should include the following:*
 - *Define the training goal*
 - *List important steps*
 - *Timeline used*
 - *Tips you learned along the way*
- b) *Include 1-2 digital photos (jpg or tif) that clearly depict the animal in the learning process or performing the desired goal (list source and photographer of each image).*

Please send entries or questions to: Jay Pratte at jpratte@zooatlanta.org (use Training Tales Entry as the subject line). Happy training!

Notes on Management of DeBrazza's Monkey (*Cercopithecus neglectus*) Group with Diabetic Individual and Intra-specific Aggression

By Jessica Franck, Keeper
Mesker Park Zoo, Evansville, Indiana
jfranck@meskerparkzoo.com

Abstract

In late 2007, a DeBrazza's monkey female named Wess was diagnosed with diabetes. Initially her glucose was monitored with urine strips and treated with Glipizide. In late 2008, keepers and vet staff began using a blood glucose monitor and insulin injections. Following an enforced separation due to removal of a birth control implant, the DeBrazza's monkey group experienced some aggression issues. Once Wess's blood glucose was stable and her new implant effective, the group was reintroduced. After a major wounding, the group became re-established and Wess's diabetes is now under control.

Introduction

Wess, born 7 June 1997, came to Mesker Park Zoo (MPZ) from Potawatomi Zoo (PZ) with 2.1 other DeBrazza's monkeys in April 2001. Wess's maternal grandmother, the other female transferred from PZ, was diagnosed with diabetes in late 2000. She was given daily Glipizide and eventually was reported as having vision problems, which may have been associated with diabetes, before her death in mid-2005 at age 21. Wess and 1.0 Sasha, born 22 June 1997, were housed together at MPZ. Wess had an accidental non-SSP® recommended pregnancy and gave birth to 0.1 Nagele in April 2002. Wess, Sasha, and Nagele were moved to their current holding and exhibit in May 2003.

In December 2007 following a routine physical exam and blood draw, Wess's results showed signs of diabetes. A subsequent blood draw that included a Fructosamine test confirmed the diagnosis. Initially the veterinarians opted to try to manage her disease with urine strips, Glipizide, and diet changes. Even though Glipizide, a drug that helps control blood sugar levels, is contra-indicated for Type I diabetes, the veterinarian had not yet determined what type Wess had. It was also decided there was not enough research available to determine if it could help and it was something other zoological institutions were trying. Type I diabetes occurs when the body destroys its own insulin-producing cells. Without insulin, the body is unable to take in the glucose produced when food is broken down. The cells essentially starve. Symptoms of Type I diabetes include dehydration, ketoacidosis, and unexplained weight loss. There were limited weights for Wess on record, but she experienced a drop of almost two kilograms (4.4 lbs.) from mid-2005 to her diagnosis in late 2007. In an ideal situation she would have been started on insulin sooner. However, MPZ had never tried to manage a diabetic animal using insulin. Other challenges included changes in the veterinary staff and a recent keeper re-organization that resulted in variation in who was responsible for Wess's daily care.

Description of Holding and Injection Method

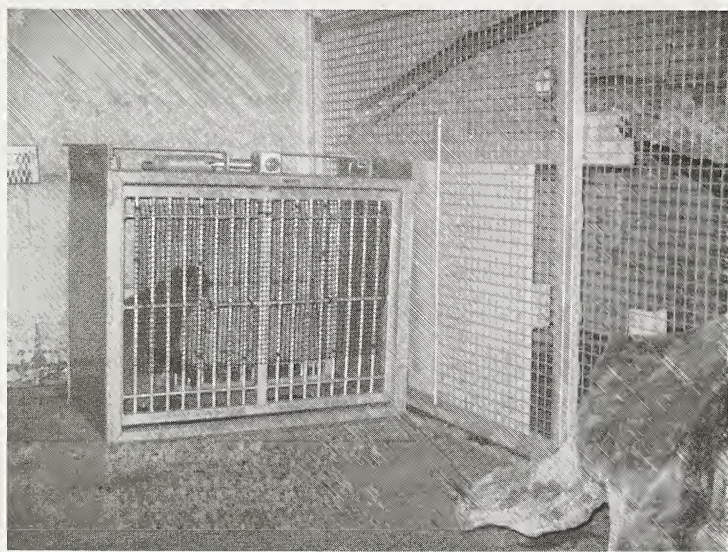
The DeBrazza's monkey holding area is in a building known as the Primate Barn. Also housed in that building are 1.0 owl monkey (*Aotus lemurinus griseimembra*), 1.1 great curassow (*Crax rubra*), 1.1 red-handed tamarins (*Saguinus midas*), 1.2 white-nosed coati (*Nasua narica*), 1.2 macaws (*Ara* sp.) and 1.2 colobus (*Colobus guereza*). The DeBrazza's monkeys have a row of three stalls (8'L x 6'W x 7'H) [2.43m x 1.82m x 2.13] with a single shift door (19"W x 24"H) [~48cm x 60.96cm] between each holding stall. The holding area is connected to the exhibit by a chute area with a guillotine door at each end. The exhibit (20'L x 16'W x 9.5'H) [6.09m x 4.87m x 2.89m] has grass substrate, various limbs and vines, and a shelf just below the chute entrance.

After the keeper work assignments were established, and knowing the eventual goal was to control Wess's diabetes with insulin injections, a training program was started in June 2008. It began with clicker and target training which she very quickly picked up. Holding and desensitization to keeper and syringe proximity without tactile contact were also achieved. However, she did not consistently allow the practice saline injections. Various set-ups were tried including protected and free-contact on exhibit and in holding. Because of Wess's inconsistency, discussions with other zoo professionals, and to make all participants comfortable with the treatment program, it was decided to start using a Lab-Care squeeze cage (30"L 17"W 24"H) [76.2cm x 43.18cm x 60.96cm] for injections and blood glucose monitoring.

Wess had already been conditioned to enter a crate using primarily negative reinforcement. After acclimatizing her to the sight of the squeeze, the same methods used to get her in a crate were used to get her in the squeeze. It was medically necessary to start her on insulin before she could be fully switched to positive reinforcement. She needed injections every day and it had to be at a certain time, making it harder to leave it up to her to voluntarily enter the squeeze. If her insulin injection was supposed to be at 1030hrs, she was given approximately 10 minutes to enter using various food rewards as coercion. If she failed to enter in that time period, varying degrees of negative reinforcement would be used starting with a stern tone to the voice and culminating in netting her as a very last resort, which only had to be done twice.

As soon as Wess was secured in the squeeze cage, she would be given an immediate food reward with lots of verbal praise. Securing her in the squeeze involved a keeper standing outside the holding stall sliding shut the small shift door between holding areas and then entering the stall to close the guillotine door of the squeeze itself. One of Wess's rewards for getting the insulin injections was immediate removal of the perceived negative stimulus. After she was secured and rewarded, the small shift between holding areas would be reopened prior to the injection so she could immediately exit the squeeze without waiting for a keeper to deal with both doors (see Figure 1). If it was a blood glucose check day, she was rewarded after being poked with the lancet and again after the insulin injection. She was rewarded again after exiting the squeeze encouraging her to remain calm before she was reunited with her conspecifics.

Wess started entering the squeeze with very little coercion very quickly. She also was found to respond well to the keeper walking away a short distance and then returning. When there was no food reward she would actually wait in the squeeze for the keeper to shut the door, but if there were



a food reward in the squeeze she would take it and exit. Initially to receive her injections, the squeeze was cranked down to the point that she was held immobile. As she and the keepers became more comfortable with the process, it became possible to give her the injections without completely squeezing her down. Now the routine is to close the squeeze about halfway and attempt to give her the injection. If she

Figure 1. Small Shift and holding set-up

responds by pushing the keeper's hand away twice, the squeeze is cranked down several more turns, but not fully, and the process is repeated. This development has had the added benefit of giving the keeper more leeway in where to give the injection. Wess invariably faces towards the exit and when she is completely squeezed down the small mesh only presents her right thigh. Not being fully restrained allows for subcutaneous injections on her dorsal region as well.

After thorough research the veterinarian chose LANTUS® Insulin, a 24-hour insulin, so Wess only needs one injection a day. The veterinarian asked to have her blood glucose checked twice a week. A shaved portion of her tail is poked with a lancet and then a drop of blood is analyzed using a Contour® blood glucose meter with non-coding strips (see Figure 2). The keeper or vet assistant notifies the vet of the number and then the vet makes adjustments to the insulin dosage (see Table 1). The vet also requested weekly weights for Wess since her body condition had been an issue. She is currently fed twice a day to keep her weight up and even though LANTUS® is designed to prevent blood sugar spikes, it probably helps to have her food consumption spaced. Her diet is weighed out and includes produce low on the Glycemic index and Mazur® leafeater primate biscuits. PZ mentioned success with high fiber biscuits, but Wess lost weight trying to switch her to a more biscuit centric diet. The veterinarian asked to switch her back believing a consistent diet was more important.



Figure 2. Blood draw on Wess's tail with glucose meter

Dealing with Aggression

Following Wess's diabetes diagnosis, it was discovered that her Melengestrol acetate (MGA) birth control implant could have exacerbated her condition. The AZA Wildlife Contraception Center recommended immediate removal of the implant, followed by a waiting period for her blood sugar to stabilize, and then reinsertion of a deslorelin implant.² Her MGA implant was removed 21 August 2008. There had been a few instances of aggression from 0.1 Nagele, but immediately following the implant removal Nagele escalated her aggressive behavior toward Wess, bouncing on limbs, eye flashing, and mouth gaping. Wess repeated these behaviors back to a lesser degree. When the females were put back together the next day, there were physical altercations where they would be locked together wrestling and attempting to bite. Wess received several wounds over the next few weeks including a bite wound to her forearm and several finger injuries. The two finger injuries occurred when the girls were separated and Wess stuck her digit through a gap.

One of the side effects of diabetes is slower healing of wounds. It was decided to keep the females separated until her new implant was inserted. Prior to Wess's diagnosis, only Sasha was separated for feeding because of his food monopolization. Following Wess's diagnosis, the females were also separated to monitor Wess's food consumption. The day's schedule meant the monkeys remained separated overnight. The normal lock-up order was Wess, Nagele, and then Sasha. Because Wess was being injured through the mesh, the order was changed to Wess, Sasha, and then Nagele so there was no contact between the females. Initially Sasha and Nagele were very hesitant with this change and it could take up to 30 minutes to achieve the correct order, but after a week they seemed comfortable with the routine change.

Table 1 - Wess's blood glucose reading with corresponding insulin dosage and significant events.

Date	Blood Glucose	Insulin Units	Events	Date	Blood Glucose	Insulin Units	Events
11-Dec-08	212	4	4	26-Oct-08	156	2	2
7-Dec-08	130	4	4	23-Oct-08	136	2	2
4-Dec-08	309	4	4	19-Oct-08	182	2	2
30-Nov-08	162	4	4	16-Oct-08	100	2	2
27-Nov-08	240	4	4	12-Oct-08	226	2 new implant	2
23-Nov-08	330	4	4	8-Oct-08	306	2	2
20-Nov-08	204	4	4	5-Oct-08	158	2	2
17-Nov-08	341	3	3	1-Oct-08	107	2	2
14-Nov-08	183	3	3	28-Sep-08	216	2	2
9-Nov-08	390	3	3	24-Sep-08	142	2	2
6-Nov-08	267	2	2	21-Sep-08		2	2
3-Nov-08			reintro to group	18-Sep-08	335	1	1
2-Nov-08	217	2	2	17-Sep-08			discont. Glipizide
30-Oct-08	217	2	2	15-Sep-08	330		
				21-Aug-08			implant removal

Another change was allowing the rest of the group to watch Wess's injections. Previously they were locked outside during the process because their alarm vocalizations were distracting Wess. As Wess started entering the squeeze more reliably, the other monkeys were allowed to watch her calmly get squeezed, poked, and rewarded. Part of the routine became to also reward the non-participants for their calm demeanor.

Wess's blood sugar stabilized and her deslorelin implant was inserted on 12 October 2008. After allowing time for the implant to become effective, Wess and Sasha were reintroduced on 2 November 2008. Their reintroduction was uneventful and several grooming sessions were recorded. The next day all three DeBrazza's monkeys were put back together. Almost immediately, Wess and Nagele began physically fighting. Wess sustained a large gash to her right forearm. With support from the Animal Curator, they were left together and the aggression dissipated that day other than an occasional limb bounce by Nagele. Based on general recommendations from a presentation on monkey introductions by Leslie Field and Lynne Villars at the Old World Monkey TAG Workshop in August 2007, the routine was changed again to separate the group for feeding but then put them back together overnight. Wess's injury was cleaned and sutured the next day. They were put back together as soon as Wess had recovered from the anesthesia and there was still no aggression. Over the next few days the females were recorded sitting in close proximity and it has remained like this ever since.

Conclusion

Wess's diabetes appears to be under control and the group is behaving like a cohesive unit. This experience emphasized the vital role that keepers play as advocates for their animals. Although Wess was being treated with Glipizide, she probably would have been started on insulin a lot sooner if she had consistent keepers helping to keep her medical care more on track. Also in hindsight, the females would have probably done better if

there were no separation, especially overnight, from the beginning. The routine changes that allowed for these successes highlight once again that it is important for animal care to be a dynamic process. The willingness of the veterinary and animal care teams to admit when things weren't working, then adjust, and try new techniques will help Wess live the best life possible and prepare MPZ to make better decisions for other animals' medical and behavioral challenges.

Acknowledgements

Sincere thanks to Dr. Tom P. Kilbane, DVM, Kristine VanHoosier, veterinary assistant, Erik Beck, General Curator MPZ, Brad Fichter, Animal Curator MPZ, Denny Vogt and Melanie Ransom, Keepers MPZ, the veterinary staff at the Potawatomi Zoo, Leslie Field, Lead Keeper Sacramento Zoo, and the other MPZ keepers that help care for Wess.

(Footnotes)

1 Communication with Dr. Kilbane on 8 Dec 08

2 Communication with K. VanHoosier in Aug 08.



Nagele (l) and Wess (r) . Wess's arm is shaved from a major wounding; the lip pout is due to missing teeth.

Photos provided by the author

REACTIONS

A Question and Answer Forum for the Zoo Professional on Crisis Management

By William K. Baker, Jr., Director
Abilene Zoo, Abilene, TX



Question

What do you look for in a dangerous animal escape drill?

Comments

By definition it is implied that when you conduct an emergency drill that involves dangerous animals that certain components are in place. There are three essential facets that should be considered in advance of conducting a drill: logistics, planning, and training. While these sound like worn catch phrases, nothing could be farther from the truth. However, that doesn't negate the power of these words and the concepts that they represent. Proactive and prepared are more than catch phrases; they're common sense. This is the first step in preparing for a crisis, the proper attitude.

Logistical support implies that there has to be adequate equipment available for the Emergency Response Team (ERT). In other words, first aid kits, SCBA's (Self Contained Breathing Apparatus), fire extinguishers, tool kits, entry tools, capture nets, animal restraint equipment, emergency oxygen units, radios, flashlights, dart rifles, and firearms. The simple truth is that only two things, your imagination and pocketbook, limit safety equipment. This raises the inevitable question; "do you have an annual budget and how large is it?" A dedicated line item is recommended to track expenses and compensate for inflation, especially in the current economy.

Facility support is absolutely necessary for a safety program to succeed. In short, it is imperative that the senior administration supports a proactive position for emergency preparedness. It is virtually impossible for responders to train without the available time for practice, range time, and emergency drills. However, these components of the safety process cannot be realized without adequate staff to cover animal management duties while other staff members are in training.

Training programs should be tailored to the needs of the institution and the composition of the animal collection. Every institutional collection and facility is inherently different in its "demographic composition". As a result, what works in one facility may not necessarily work at another. Still, there are some basic tenants, which should be considered. Safety training can be pursued through local, state, national, and private resources such as consultants. Which resources are utilized is dependent on the investment of finances and time.

In my experience, training has to be the most overlooked facet of this whole process. Going to the firearms range once a year or even quarterly is ineffectual. Ideally your firearms and dart personnel should be practicing once a month. A good benchmark for rounds expended is 100 rounds shotgun and 20 rounds rifle at minimum per person. In terms of darts, I would recommend at least 20 darts per person, with 40 being the goal per person, per month.

Once the groundwork has been done, then it's a matter of deciding what type of drill to undertake. In essence there are two types of drills: Limited Response and Facility Response.

Limited response drills are basically exercises that are geared strictly for emergency responders, Emergency Response Teams (ERT's), Crisis Management Teams (CMT's), and Strategic Response Teams (SRT's).

The purpose of these drills is to hone the skills of the responders. As a general rule it is unnecessary to interrupt facility operations for these training exercises. Much of the training can be facilitated in a classroom environment utilizing scenario- based, role-playing games to hone judgment skills. The firing range can also be a useful environment for quick reaction exercises. It is also recommended that eventually in the process your firearms and dart personnel practice together. This coordinates the actions of both parties, identifies problems, and will acclimate dart personnel to a firearms presence as well as to the report of live fire.

Walk-through exercises can prove to be useful for a team. One of the basic variants on this exercise is to draft a staff member from a specific department to be the "escaped animal". Think of it as "tag" with only your skill and wits against say a "cat staffer" who will do their best to elude you, while it is necessary for you to locate them and physically tag them. Sounds childish and easy - it's not. You're about to track someone who intimately understands cat behavior. By using other departments it's possible to conduct in-house workshops on behavior. After all, you're surrounded by animal professionals; use the resources at hand. With a little imagination it's possible to find options other than running through the facility creating a scene.

Walk-through exercises can also be effectively used as an intermediate step in the process. This would be the next logical step in the progression of training. It allows Visitor Services, Maintenance, and other support personnel the opportunity to learn and practice their roles in the process. In addition, animal staff who are non-involved parties can also practice their role in bringing animals in off-exhibit, and securing their respective areas. Then everyone is in a position to become the eyes and ears of the facility. This is especially important if a dangerous specimen changes location and must be reacquired.

Facility response drills are exactly that, facility-wide drills are held on either an announced or an unannounced basis, and usually on a quarterly or annual basis. A scenario is chosen and can be executed before public hours or even during public hours. Zoo visitors often find it rewarding and reassuring that their local zoo is practicing for these types of crisis. However, the key to true authenticity is to ensure that the date and time is confidential information, thereby insuring that a facility drill is an immersion experience. Observers should grade the performance of all sectors of the facility. Afterwards, the observers should conduct a roundtable discussion to establish ways to increase performance. This allows the senior staff and emergency responders to develop revised policies before a real crisis occurs, not after the fact.

When considering options for different scenarios, these can be simple or complex in nature. Remember, the vast majority of crisis events are resolved without major incident. Animal escapes are usually resolved with the specimen being returned safely to their enclosure and in good condition. Conversely, crises should not be restricted to the purview of animal escapes alone. Fires, hazardous materials, power outages, and serious storms are more likely to be a clear and present danger.

As a result, mixed-scenario drills are the best way to insure complexity that will reflect the true nature of a crisis management situation. For example, in a dangerous animal escape start with a

scenario in a night house. This limits tactics, types of firearms, dart rifle pressures, and the sheer amount of personnel that you can even fit in a building. Next have a keeper "down" with injuries. This tests first aid and the EMT response while complicating the time factor. You must secure the animal before you rescue the victim and render aid. Since it's in a night house, one of two scenarios could play out, human error or mechanical failure. So, you throw in a mechanical failure, which will test your maintenance response as well.

The key to real success is using your imagination and "thinking outside the box".

Next Column: Can behavioral research and observations play a part in being prepared for a crisis?

**If you would like to submit a question for this column or have comments on previously published materials, please send them to AAZK, Inc., 3601 S.W. 29th St., Suite 133, Topeka, KS 66614
Attn: Reactions/AKF**

(About the Author: Since 1985 Bill has been active in the fields of science, zoology, and wildlife management. His education and experience include a B.S. in wildlife management and post-graduate studies in zoology, Lab and Museum Assistant, Shoot Team Leader, ERT Member, Large Mammal Keeper, Senior Keeper, and Zoo Curator at various zoological facilities. His area of research is crisis management in zoological institutions, which draws upon practical experience and training as a Rescue Diver, Hunter Safety Instructor, NRA Firearms Instructor, and Red Cross CPR/First Aid Instructor. Away from work he operates Panthera Research and may be contacted at puma_cat@hotmail.com).

Searching for Your Support!

What if AAZK earned a penny every time you searched the Internet? Or how about if a percentage of every purchase you made online went to support our cause? Well, now you can! GoodSearch.com is a Yahoo-powered search engine that donates half of its advertising revenue, about a penny per search, to the charities its users designate. Use it just as you would any search engine, get quality search results from Yahoo, and watch the donations add up! Each search generates a penny for AAZK - and that can add up quickly!

Here's an example of how much AAZK can earn:

100 supporters search 4x a day = \$1460/year

500 supporters search 4x a day = \$7300/year

1000 supporters search 4x a day = \$14,600/year

We have approximately 1500 professional AAZK members - imagine the amount we could bring in if everyone got on board! Go to the AAZK website (www.aazk.org) and look on the right-hand side of the homepage near the bottom--there you will find the GoodSearch icon. Click on it to get started today and support your organization every time you do an Internet search! You can also help out AAZK by shopping through the iGive.com link from our homepage. This site offers over 680 retailers to choose from including stores like the GAP, Staples, Land's End, Home Depot, Adidas, and many more. A complete listing of all the participating merchants is available at the iGive site. A percentage of each purchase comes back to AAZK. Just register, select American Association of Zoo Keepers as your organization to support and you're ready to shop!. HAPPY SEARRCHING AND HAPPY SHOPPING!

Simultaneous Training of 1.0 *Equus grevyi* and 0.1 *Homo sapien*

By
Meaghan Goulder, Zookeeper
Hoofstock and Red Pandas
Zoo Boise, Boise, ID

In The Beginning . . .

Training of our male Grevy's zebra (*Equus grevyi*) began, as many of my activities do, by accident. Zoo Boise hired a consultant in 2004 to give staff an overview of training techniques, and we were asked to choose an animal in our section to work with. I had decided at that time that the animal I wanted to husbandry train was our male gemsbok antelope (*Oryx g. gazella*), so I purchased an extendable tent pole and topped it with a small Styrofoam® ball, then set about attempting to target train him with the limited knowledge I had. He retaliated by spending the next several weeks sparring with my target through his fence, bending the pole to the degree that it was no longer extendable.

My flounderings were generally observed by the gemsbok's neighbor, "Wyatt Earp" the Grevy's zebra. Wyatt was born in 1998 and had come to the zoo a year later. He was initially housed with an older male that was dominant and often aggressive towards him. Wyatt's timid behavior allowed us to work in the exhibit for several years without having to shift him.

After his exhibit mate died, we noticed an increase in Wyatt's aggressiveness. This showed itself most in the usual equine ways: braying, kicking at the fence (especially when strangers or vehicles passed by), and occasional lunges towards keepers. Valuing our body parts, it was decided to shift the zebra to the runway when keepers had to go far into his exhibit, although we still felt we could reliably enter his barn to drop off food at the feeder when the zebra was nearby.

Wyatt had been shifting to the runway for quite some time before I apathetically decided to copy the gemsbok's training with him. I started target training through the runway gate, and it didn't take the zebra long to associate the clicker "bridge" with the carrot reward and to figure out that he had to touch the target pole with some part of his head in order to get bridged. He seemed eager to target. The gemsbok did not. It was at this point that I nobly made the decision to switch my training efforts from the gemsbok to the zebra . . . for *their* sake, of course.

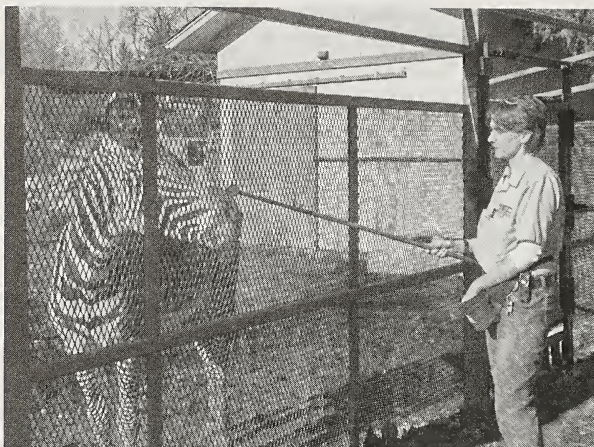
"Help Me Help You" (Or At Least Don't Hurt Me)

Training at the eight-foot-long runway gate continued for quite some time, and consisted primarily of moving the target to different spots along the chain link and having the zebra touch those areas. I found it to be very limiting, however, so we eventually began training along the entire runway fence, usually when I was in the runway and Wyatt was on display. Although the gaps in the fence here were too tight to pass carrots through, rewards could be handed to the zebra over or under the fence, and training in this way greatly increased our mobility.

As the zebra moved along the fence, we were better able to work on having him touch only his nose, and no other part of his face, to the target to earn his reward. This behavior took some time to learn, as Wyatt often preferred to bite at the target ball. We graduated on to placing the target behind him so that he had to turn around, which let me see whichever side of his body I needed to inspect. We also trained with the target positioned a few inches over his head so that he'd lift his neck and give me a good view of his chest. This was another behavior that took awhile, since Wyatt showed both his laziness and his problem-solving skills by instead choosing to bite higher up the target pole, thereby forcing the Styrofoam® ball down to where he could more easily reach it.

¹ For the purposes of this article, I will often use "we" or "us". Although I have for the most part been the only zookeeper doing the training, I feel it is only fair to include the zebra as a member of the training team.

As this “runway training” was progressing, we also began “barn training” at the door between the keeper service area and the zebra’s barn. I felt it was important to do training here, as it allowed us to work on desensitizing the zebra to touch. The drawback to this location for training was that there was no way to keep Wyatt from pushing past me and into the service area and, although he had never tried to do so before, we felt it prudent not to invite trouble.



Targeting at the runway fence

I created a makeshift half-door by stringing a heavy pad across the doorway to the barn and began training with me on one side of the pad and the zebra on the other. Wyatt immediately set about proving not only his stubbornness but my naïveté by leaning much of his weight against the pad, thus threatening to break some part of it. He then spent much of his training sessions trying to bite my knees and grabbing at the rewards. Needless to say, training became a very frustrating and slow process. At this time the zoo graciously offered to have a dutch door installed in front of the service door.

I never asked if this was to save me from the zebra’s aggression or save the zebra from my inexperience; nevertheless, this half-door became a vital modification to the training regime. Once Wyatt had spent some time testing the door and found that he could no longer push through it, he settled down and became calmer while training. Training progressed at a faster pace.

Let’s Get Physical

We worked on behaviors that would allow me to touch around Wyatt’s face, have him target to the pole and to my hand, and have him leave the barn and return when commanded. I found that it took the zebra longer than I would have thought necessary to respond to my verbal commands, and I felt I wasn’t getting my intentions across to him clearly enough. After consulting with other keepers, we decided to add physical cues to the verbal ones. We thus came up with hand gestures to go along with the verbal cues to “target”, “feel” specific parts of Wyatt’s face, “get back” from the barn, and “come on in” to the barn. Wyatt began responding much more quickly with the introduction of the physical cues.

It took some extra work to get Wyatt to stay out of the barn until he was called in: he will usually “test” me and his relief keepers by coming in early while we are still dropping off food. Unfortunately, the only way I could initially train him to leave the barn was with positive punishment: I would shake an old whip close to him while giving the verbal cue to “get back” until he left. I tried to follow that with positive reinforcement: throwing a carrot reward out to him in the yard once he’d left. Soon I was able to discontinue using the whip and just use the verbal cue and a hand signal to keep the zebra out. To this day, he is impatient to return to the barn, so I often have to freeze in my tracks and give him a warning “Hey!” when he starts to come in; this usually does the trick.

We bring his hay to the feeder on a trashcan lid, so it is easy to pick up the whole lid with hay on it and back out of the barn if Wyatt insists on coming in before called. However, I’ve found that the zebra will usually ignore any commands and keep coming in once the food is off the lid and in the feeder trough (and therefore not easy for his keepers to safely remove), so I try to leave the barn quickly after dropping off food. I realize this means we don’t fully have the zebra’s behavior under control, but I must accept my own deficiencies in this department and recognize that it is better to have the behavior partly under control than to try to push the animal and risk getting hurt.

This Will Hurt Me More Than It'll Hurt You

In 2005 we discovered the zebra was having seizures. Although zoo staff never saw any of these episodes, visitors reported them and we also observed that Wyatt was getting cuts above his eyes, presumably from falling to the ground. We began to work on touching above Wyatt's eyes, which allowed us to apply medications to fresh cuts to keep them from getting infected. We also administered Phenobarbital twice daily on his food, and dropping the medication to him was made safer by having him exit and enter the barn on command.

It was also in 2005 that we decided to add syringe training to the zebra's repertoire. Many institutions have had success training captive animals to accept injections, and Zoo Boise's veterinarian and I were eager to administer vaccinations to Wyatt in this way instead of the traditional method of using the dart rifle. As we planned on injecting him in his neck, my first step was to install a protective barrier between me and the zebra's teeth. Our maintenance staff used an old plastic storage box - a little bigger than the zebra's head - to fabricate an open-ended box that could be slipped over the zebra's dutch door. It would act almost like a large "collar" around the zebra's head when he was in it. We then set about desensitizing the zebra to the box.

We began with the box on the service area floor behind me, where the zebra could see it during training. After a few days, I placed the box over the dutch door, but ignored it while training the zebra. Wyatt seemed unconcerned, so I quickly moved on to placing my target pole through the box and having the zebra target to it, then offering the reward through the box as well. I planned on inching the target pole further and further through the box, thus having the zebra slip his head slowly inside over the course of several weeks. Wyatt, however, apparently found this unnecessary, and was sticking his head deep into the box within a few days.

We then graduated to getting Wyatt comfortable with me scratching the side of his neck while he was in the box. Once he was used to this, I showed him a syringe while scratching his neck. When he continued to remain calm I moved on to lightly poking him with a paperclip, then showing him a covered syringe and using it to apply pressure to his neck. Soon I was briefly poking him beneath the skin with a diabetic's needle, and gradually we increased the size of the needle. We worked on poking with the syringe for an increasing time, but could never do it for more than about four seconds before Wyatt



Touch desensitization

looked like he was going to back away. I always showed him the syringe before I poked him so he'd know what was possibly coming, and I generally offered him a larger treat just before poking him to distract him, followed by a large treat for not reacting to the syringe.

Breakthroughs and Setbacks and Breakthroughs Again

We purposefully took our time with the training, so it wasn't until 2006 that I tried injecting a vaccine into the zebra for the first time. Our veterinarian gave me 1cc of a vaccination, and the zebra took it well. Several days later we repeated the procedure with a different vaccine, but we were barely able to administer it before the zebra shook off the syringe. I wondered if I'd poked too hard this time.

Several times over the course of the next year, we were able to poke with either an empty syringe or one with 1cc of saline. However, by mid-2007 Wyatt was automatically shaking his head when pressure of any kind from a covered syringe was placed on his neck. We started not showing the syringe to him first to see if that would stop the behavior, but it didn't.

I noticed towards the end of 2007 that Wyatt had taken to shaking his head inside the box if I touched his neck with just my hand, although he wouldn't do so outside the box. He also began lunging towards my hand more when he was in the box and throwing his head around inside, to the point that he was sometimes almost getting the box off the door. I worried that he was getting nervous being "confined" in the box and that he was learning aggressive behaviors. Clearly, it was time for a new tactic.



Box training at Dutch door

Eureka . . . Sort Of

These new modifications to the training regime have helped us meet our training needs: in the summer of 2008, we were able to hand-inject Wyatt with vaccinations twice within a month.

It is important to note that, once the zebra is poked with the syringe, he will hurriedly leave the barn within a few seconds, long before commanded to do so by his trainer. We realize this again means that we do not have Wyatt's training fully under control. However, we still view training as successful for several reasons. First of all, we are able to deliver vaccines fairly confidently by hand, thereby eliminating the need for the more risky and stressful method of delivery via dart rifle. Secondly, the zebra is obviously not too traumatized by this training: he always returns almost immediately to the barn after an injection to perform a few more commands before we end that session, and he calmly trains the following days as if unfazed by the injection.

We feel it is best not to push the zebra too much with syringe training: while we will continue to apply pressure to his neck with a covered syringe during training sessions, we will reserve actually injecting him for the few times a year that he needs vaccinations.

In Conclusion: What We've Learned Together

Training sessions seem to go better if we train earlier in the afternoon: Wyatt often seems impatient just before the zoo closes and is more likely to grab

I again turned to our maintenance department that fabricated a simple board partition to place on the dutch door, eliminating the need for the box. This new board partition has several advantages. First, it allows the zebra to feel less confined during syringe training and therefore more relaxed. Second, it takes up less room on the door, so it is now possible for me to access both sides of the zebra's neck, difficult to do before with the bulkier box.

In training recently, it seems Wyatt continues to shake his head when pressure is placed on the right side of his neck (the side on which he was always poked with the old box set-up), but he does not often do so for pressure on his left. While I continue to train for injections on both sides of his neck, I have switched to concentrating most on his left side.



Training using wooden partition

at treats then. I wonder if this is due to frustration at being ignored much of the day, so I am happy to break up the monotony by training earlier, when I can.



Wyatt on one side of wooden partition

Training takes less than two minutes a day and has yielded several advantages. Although many behaviors aren't totally under control, I believe the attention the zebra gets with this daily interaction has helped calm him down significantly. Although he still often brays when machines are brought past his exhibit, he rarely kicks at the fence. It also seems that he is more curious than hostile about strangers in the runway: as long as I am with them and I periodically reinforce the zebra for staying calm, he seldom brays with strangers present.

Another important outcome has been the higher level of trust I feel we have with Wyatt. Once a month we switch the zebra and gemsbok between their exhibits for enrichment, which they both seem to respond well to. In order to do this, I need to be in the runway with the zebra for a few seconds so he can travel down to the gemsbok's exhibit. Each time I ask another keeper to be nearby and act as a "spotter", and I place something between the zebra and me - such as a cart or barrel - while I'm in this vulnerable position. The zebra

has always been more focused on getting to the new exhibit than staying around me, and he does not kick or show his teeth as he passes. Although I will never be comfortable enough with the zebra to switch him without a small barricade between us and a keeper to back me up, I recognize that we by no means would have ever been able to offer this enrichment to Wyatt had he not calmed considerably from training and showed signs of non-aggression towards his keepers.

The training process has turned out to be one of the most rewarding aspects of my job. Although I realize that I know very little about training, I've been lucky to work through the process with such an intelligent, eager animal. I think Wyatt has profited from the increased attention and distraction. I know I've profited from the mental stimulation and the closeness I feel I have with him now.

All photos courtesy of Zoo Boise.

Big Cat Internships Available

Join us in

"Saving Tigers One by One"



**As seen on Animal Planet®
"Growing Up Tiger"**



Apply at: www.tigercreek.org

Learn about Big Cat Management. Internship involves Animal Care Apprentice and Public Education. We offer experience that counts towards employment.

TIGER MISSING LINK FOUNDATION / TIGER CREEK WILDLIFE REFUGE

Restraint of Przewalski's Horses (*Equus ferus przewalskii*) for Reproductive Studies at the National Zoo's Conservation and Research Center (NZIP-CRC) at Front Royal, VA

*By Mark MacNamara, Fauna Research, Inc.
8 Bard Ave. Red Hook, NY 12571*

and

*Linwood R. Williamson, Center for Species Survival,
Smithsonian's National Zoological Park, Conservation & Research Center
Front Royal, VA*

Abstract

A description of the National Zoo's Conservation & Research Center Przewalski's horse facility is presented and illustrates a successful layout of pens, alleys, stalls and a hydraulic restraint device (Tamer®). The facility provides good animal flow, safety for keepers and horses and allows for low stress, repeat handling and the ability to perform a wide array of veterinary procedures. The importance of training and conditioning of the horses to the facility and the restraint equipment is emphasized. The hydraulic Tamer® allows zoo personnel to handle the horses on a regular basis without the use of chemical immobilization, making it possible to conduct long-term reproductive studies that often require repeat handling for rectal palpations, ultrasound exams, hormone injections and monitoring ovarian activity.

Introduction

Reproductive studies provide critical information on species biology and are the basis for most of the successful breeding programs in zoological collections today. Well designed animal management and handling facilities, and appropriate manual restraint equipment, used in conjunction with diligent training and conditioning of animals to the study procedures, are essential for obtaining meaningful results. The Przewalski's horses at NZP-CRC have been the subjects of reproductive studies for over three years. Since 2006, 443 full restraints of nine different horses have been recorded. The facility's (Figure 1), restraint equipment (Photographs 1 and 2), and the training procedures used in these studies are described and presented here. Reproductive study results will be reported elsewhere.

Facilities

The handling facilities are located in a barn situated between two pastures and consist of a large sorting stall (26' x 38'), an alleyway 38' long with a built-in electronic scale (35" wide x 97" long), six staging stalls (each 42" wide x 97" long). The upper portion of the staging stalls sides are vertical bars spaced three inches apart that provide good visibility for the horses and keepers. There is a protected keeper space between the staging stalls that is 36" wide x 24' long. This space allows keepers to encourage the horses to move toward the hydraulic device for restraint. An observation stall (8' x 11') at the exit of the restraint allows animals to be held for observation after being in the Tamer® and before being released to the herd stall (28' x 67') and finally out to pasture. The substrate is clay for the stalls and bluestone dust for the alleyways and restraint. There is a 3/4" thick rubber stall mat as flooring within the restraint. Animal flow is generally left to right, although horses can enter the Tamer® in either direction.

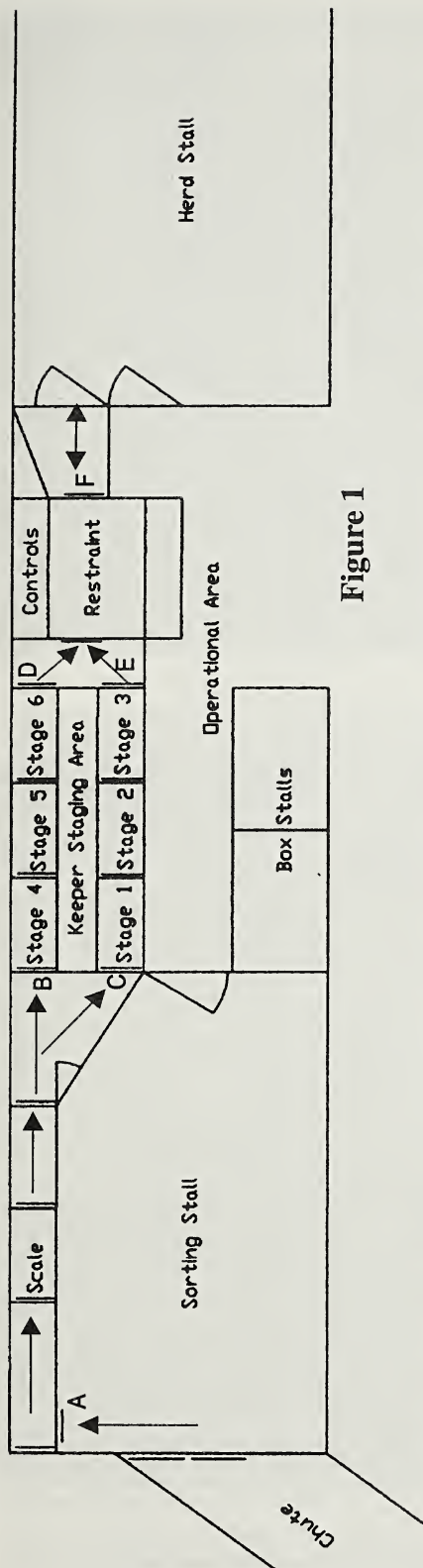


Figure 1

Animal Flow: Horses are brought into the sorting stall from the chute and enter the alleyway via gate A, proceeding across the scale and enter the staging stalls via gate B or C. Animals are then given access to the hydraulic restraint via gates D or E, move through the restraint device and then into the observation stall and finally into the herd stall via gate F. From the herd stall, each horse either is released directly to Pasture 2 or reversed back through the tamer and staging stalls and returned to Pasture 1.

Restraint equipment:

- The Tamer® is a hydraulically-operated restraint device for large, exotic hoof stock, including wild equids.
- There is a 4' wide catwalk on each side of the restraint for animal handlers.
- Four steel sliding doors and four smaller swing doors provide easy access to restrained horses.
- 4" thick, high density foam pads with heavy-duty, rip-stop vinyl covers provide a secure and comfortable restraint.
- Hydraulic controls mounted on the unit with adjustable pressure control and an easy-to-read pressure gauge allow for firm, but gentle restraint.
- The padded sides open up to 72" wide and have a 24" lift capacity.
- The sides are controlled by nine hydraulic cylinders for squeeze and lift movements.

Preparation for reproductive studies:

To collect the necessary data for ongoing reproductive studies, each horse was conditioned and trained to be separated from the herd and run through the facility. Each horse was stopped briefly at various points in the chute system and eventually stopped in the Tamer® itself and restrained for various procedures. This was accomplished by incorporating the conditioning into the daily routine of the horses. Initially the horses were run through the facility with all doors and stops open so they could move through the facility unobstructed.

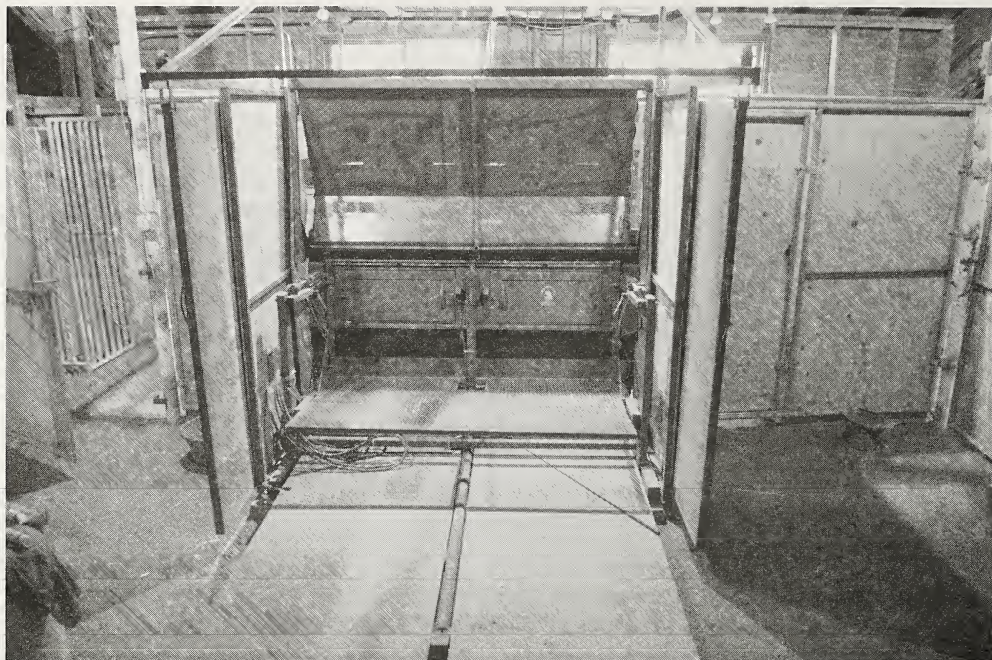


Fig. 2. Moveable side of TAMER® with access doors closed

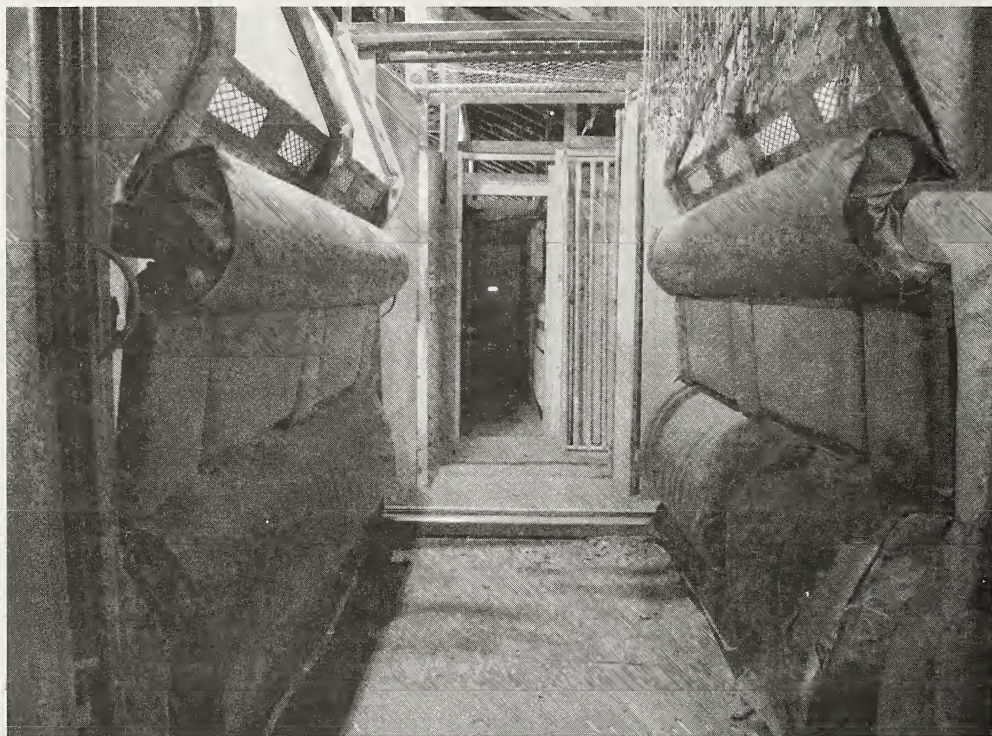
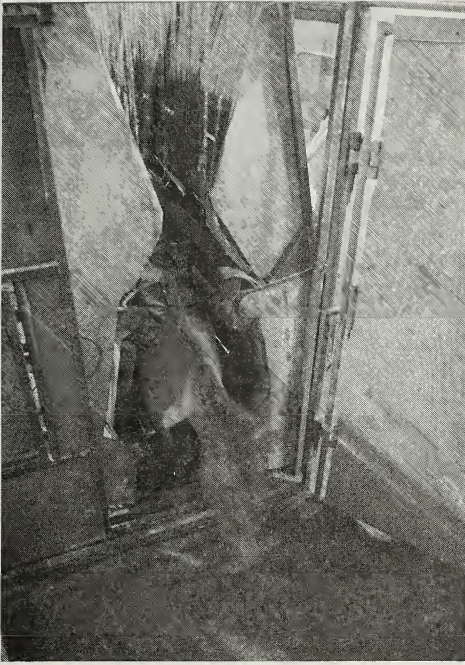
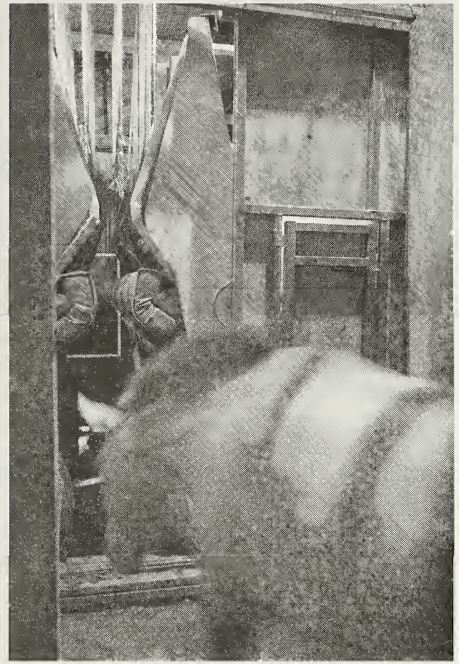


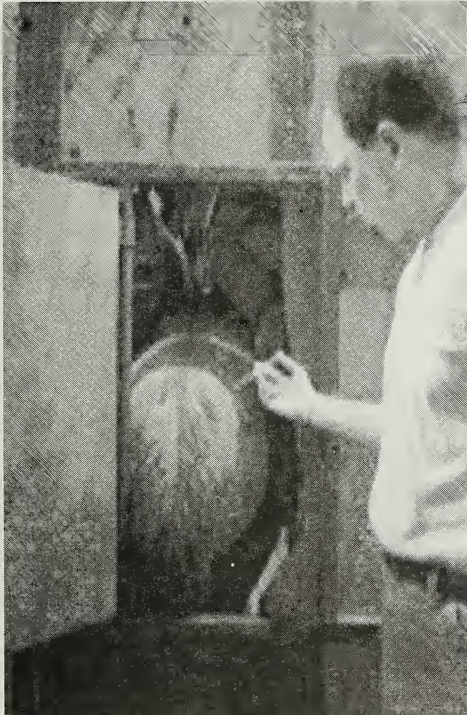
Fig. 3. TAMER® in open position looking toward the entrance alleyway



Horse entering TAMER®



Horse exiting TAMER®



Top: Injections are given safely and easily by Dr. Luis Padilla, CRC veterinarian. **At Right:** Wynne Collins, Doctoral Fellow and Principal Investigator (r) and Kristen Flaggs, Mammal Dept. Intern (l) perform an ultrasound on a P. horse.



Once completely through the facility, the horses were rewarded by being given access to green pasture. As the process continued, additional rewards were added at strategic points such as food reward (apples and fiber biscuits). Over time, doors were closed, and horses were stalled individually for a few seconds and then allowed to proceed to the next stage. At the end, animals were rewarded with food and/or immediate access to green pasture. The time required for successful acclimation to the process varied individually with each horse (1 to 6 months). Consistency with the training regimen was extremely important in achieving success.

Discussion:

Well-designed animal holding and management facilities that incorporate a manual restraint device such as a Tamer® are essential for the proper care and welfare of captive animals. Facilities at NZP-CRC and the conditioning of Przewalski's horses by the staff not only have provided a non-stressful environment for the horses, but have allowed investigators to develop a research program to help understand the fundamental reproductive biology of the Przewalski's horse. This information and the availability of safe restraint now are being used to apply artificial insemination technology for the improved genetic management of this endangered species.

Specifically the Tamer® is used for:

- 1) Female reproductive examinations – rectal palpation, ultrasonography, monitoring ovarian activity, pregnancy detection, hormone injections and artificial insemination after inducing standing sedation.
- 2) Minor veterinary procedures – injection of anesthetics for artificial insemination; treatment of cuts and abrasions.



Acknowledgments:

We thank Dolores Reed, David Shiflett, Greg Peterson, Shannon Hunter and Jessica Kordell (Mammal Keepers); Ken Lang (Mammal Supervisor); Luis Padilla (Staff Veterinarian), Budhan Pukazhenth, (Ungulate Biologist) and Wynne Collins (Doctoral Fellow) for assistance with training the horses and sharing experiences. We also thank Lisa Ware, Veterinary Technician for providing the photographs.

Product manufacturers:

Tamers®: Fauna Research, Inc.,
8 Bard Avenue,
Red Hook, New York, 12571,
U.S.A. (faunaresearch@yahoo.com)

P. Horse in the Snow -
winter at CRC in Front Royal, VA

*All photos for this article
by Lisa Ware, Vet Tech at CRC*



EO Editor - Rachel Daneault, Disney's Animal Kingdom

We Need Your Submissions

Since the days of Robert Yerkes and Heine Heideger, enrichment has evolved into a dynamic process. Zoos across the country are now regarding enrichment as a process rather than just single device initiatives. Zoo staff are looking at enrichment as holistic, emphasizing many aspects of the animals' behavior and environment. Enrichment programs are focusing on the importance of having goals for enrichment initiatives and promoting species appropriate behaviors. Zoo staffs are documenting how their animals are reacting to initiatives and using this information to improve animals' welfare. Animals' individual and natural histories are being studied to develop more appropriate enrichment initiatives.

We are looking for articles that discuss enrichment processes and philosophies as well as device articles. We would like device articles that discuss not only the construction of the device but also goals, behaviors to be encouraged and documentation. In Figure 1, you will find an outline that defines what we would like to see in an article about a particular enrichment initiative. We also want to know about the processes at your institution and how they work for you.

Here comes the critical piece to this equation. We need you, our readers, because you are our most important contributors. We need you to submit articles for publication. We want to share information with institutions all over the world, but we can't do it without your submissions. We want to hear about how the enrichment process works for your facility. We want to know about specific enrichment devices that are working for your animals.

Thank you in advance for your contributions!

Sincerely,

Rachel Daneault
Editor for the Enrichment Options Column

Figure 1:

The following template (from Mellen & Sevenich MacPhee, 2001) is to provide a loose set of guidelines for enrichment initiative articles to be submitted to the Enrichment Options Column. The article should include but is not limited to the information outlined in the template.

I. Setting Goals

- a. What behaviors are you trying to encourage with this enrichment device?
- b. Are these behaviors species specific? Was the animal's natural/individual history used to develop goal behaviors?
- c. Does the initiative serve a higher purpose other than just promoting certain behaviors? (e.g. Puzzle feeders used to distract animals from aggressive behavior with conspecifics)

II. Planning

- a. Sketches of prototypes, materials needed (including possible sources)
- b. Cost analysis
- c. Approval process
- d. Safety concerns
- e. Resources (time, staffing, implementation needs, etc.)

III. Implementation

- a. How the device was delivered to the animal
- b. How often the device is utilized
- c. How long was it in with the animal to ensure novelty retention

IV. Documentation

- a. How did you document the animal's reaction to the device? (e.g. Wrote in daily report that animal used device, video taped animal using device, etc)
- b. Did you use any scientific methods to document the results?

V. Evaluate

- a. How did you ascertain that the enrichment was successful? (e.g. Checked daily records over time, visually saw animal utilizing enrichment)

VI. Re-evaluate

- a. Were any modifications made to the device after evaluating if it was successful?
- b. Are any future changes recommended to make the device function better, with greater ease, more safely, etc.?

References:

Mellen, J.; Sevenich MacPhee, M. 2001. Philosophy of environmental enrichment: Past, present and future. Zoo Biology 20: 211-226

www.animalenrichment.org

Monterey Bay Aquarium Helps You Pick The Right Sushi

By Ken Peterson

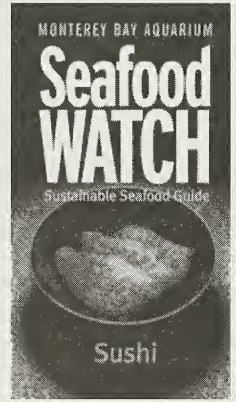
Monterey, CA - Blue Ocean Institute, Environmental Defense Fund, Monterey Bay Aquarium are collaborating to promote ocean-friendly selections. Sushi lovers nationwide will soon have a way to make seafood choices that please the palate and safeguard the world's ocean wildlife.

In late October, three leading ocean conservation organizations – Blue Ocean Institute, Environmental Defense Fund and the Monterey Bay Aquarium – made available to the public color-coded consumer guides ranking popular sushi selections based on whether they are prepared using seafood that's caught or farmed in ways that harm the ocean or pose a health risk to people.

While the consumer guides – in print, online and mobile device versions – differ in appearance, they are based on similar data, and offer one consistent message: Sushi choices by individual consumers have an impact on the future of the ocean.

“For the first time, sushi lovers have tools that enable them to join the growing movement of those making ocean-friendly choices that protect life in the seas now and for generations to come,” said Julie Pareles, executive director of Blue Ocean Institute (www.blueocean.org).

“These new guides not only enable sushi lovers to choose fish that are caught or farmed responsibly, they also highlight selections that are healthy for them and their families,” said Tim Fitzgerald, marine scientist for Environmental Defense Fund (www.edf.org).



“The reality is quite simple,” said Sheila Bowman, Seafood Watch outreach manager at the Monterey Bay Aquarium (www.montereybayaquarium.org). “If you care about the future of the oceans, you’ll avoid red-listed sushi.”

For sushi aficionados, that means both pleasant surprises – and some disappointments. Popular items like bluefin tuna (hon maguro/kuro maguro) and freshwater eel (unagi) are firmly on the “red” list, as is farmed salmon (sake). These species are either overfished, farmed with aquaculture methods that pollute the ocean, or caught using methods that destroy ocean habitats or kill large amounts of other sea life.

Items like wild-caught Alaska salmon (sake), farmed scallops (hotate) and Pacific halibut (hirame) are more sustainable choices, in part because they come from abundant, well-managed fisheries or – in the case of scallops – are raised using sustainable aquaculture methods.

All three guides offer a substantially consistent message about the best selections, as well as the fish to avoid when choosing sushi.

“While we consider similar factors in assessing each fishery, we each tabulate the environmental information in slightly different ways,” said Kate McLaughlin, Blue Ocean Institute’s Seafood Program Director. “That results in subtle variations for a handful of rankings.”

“The differences are minor,” Bowman said. “Regardless of which sushi guide people rely on, everyone from chefs to consumers now has a very clear picture of what their sushi choices mean for ocean wildlife.”

All three guides incorporate human health recommendations from Environmental Defense Fund, and fish that contain levels of mercury or PCBs that may pose a health risk to adults or children are flagged. Fisheries researchers from the Blue Ocean Institute and Monterey Bay Aquarium evaluated the seafood species included on the guides. The Monterey Bay Aquarium seafood rankings are the basis for items selected by Environmental Defense Fund for inclusion in its sushi guide.

The Blue Ocean Institute sushi guides are available at www.blueocean.org; Environmental Defense Fund guides at www.edf.org/seafood; and Monterey Bay Aquarium Seafood Watch sushi guides at www.seafoodwatch.org.

Blue Ocean Institute, Monterey Bay Aquarium, and Environmental Defense Fund are also part of a larger consortium of marine conservation organizations known as the Conservation Alliance for Seafood Solutions (www.solutionsforseafood.org). In May of 2008, the consortium released its "Common Vision for Environmentally Sustainable Seafood," promoting steps companies can take to develop and implement comprehensive corporate policies on sustainable wild-caught and farmed seafood.

About Blue Ocean Institute

Blue Ocean Institute works to inspire a closer relationship with the sea through science, art and literature. Blue Ocean translates science into information people can understand and use to take action on behalf of the ocean. Blue Ocean's From Sea to Table program shares reliable information that enlightens personal choices and helps restore living abundance in the sea. In addition to wallet-sized seafood guides, Blue Ocean provides FishPhone, the nation's first sustainable seafood text messaging service (text FISH and the species name to 30644 for instant information). Additional programs focus on art and poetry, training chefs in sustainable seafood practices, and research and writing about ocean-related climate and chemistry change. www.blueocean.org

About the Environmental Defense Fund

A leading national nonprofit organization, Environmental Defense Fund represents more than 500,000 members. Since 1967, Environmental Defense Fund has linked science, economics, law and innovative private-sector partnerships to create breakthrough solutions to the most serious environmental problems. www.edf.org

About the Monterey Bay Aquarium

The mission of the nonprofit Monterey Bay Aquarium is to inspire conservation of the oceans. Through its award-winning exhibits, education programs and cutting-edge marine research, it has established itself as a leader among aquariums worldwide. It is consistently ranked as the No. 1 aquarium in the United States and the top aquarium for families. It has reached more than 43 million visitors, and tens of millions more through its website and through outreach programs like Seafood Watch. The Aquarium's Sustainable Seafood Initiative works to transform the seafood market in ways that support sustainable fisheries practices and fish-farming operations. www.montereybayaquarium.org, www.seafoodwatch.org

Source: Reprinted with permission from Zoo and Aquarium Zoo visitor eNews 10-1-08

Zoo and Aquarium Visitor Magazine: You may obtain a FREE subscription to our monthly eNewsletter at <http://www.zandavisitor.com/enewssubscription>.



Book Reviews

Turtles of the Southwest

By Kurt Buhlmann, Tracey Tuberville & Whit Gibbons

Published July 2008, Publisher: University of Georgia Press, Athens

Softbound, iv + 264 pages, ISBN 978-0-8203-2902-4

List price: \$22.95

Seventy-five percent of the turtle species in the United States can be found in the southeastern U.S. In fact, the region is second only to parts of Asia in its number of native turtles. Filled with more than two hundred color photographs and written with a special focus on conservation, this guide covers forty-five species of this non-threatening, ancient lineage of long-lived chelonians.

Heavily illustrated, fact-filled descriptions of each species and its habitat comprise the heart of the book. Species accounts cover such information as descriptions of adults and hatchlings; key identifiers including size and distinctive characters and markings; land, river, pond, and wetland habitats; behaviors and activities; food and diet; reproduction; predators and defense; and conservation issues.

Also included is a wealth of general information about the importance of turtle conservation and the biology, diversity, and life history of turtles. Discussed are distinguishing turtle characteristics; differences among turtles, tortoises, and terrapins; shell structure and architecture; reproduction and longevity; turtle predators and defense mechanisms; and turtle activities such as basking, hibernation, aestivation, and seasonal movement. Useful information about the interactions of humans and turtles is also covered: species that are likely to be commonly encountered, and more. To order this book, call 1 (800) 266-5842 or email books@ugapress.uga.edu

Gators, Gourheads, & Pufflings: A biologist slogs, climbs, and wings her way to save wildlife

By Susan D. Jewell

Published November 2008 by Infinity Publishing

ISBN: 0-7414-4961-7

\$14.95 (paperback)

Gators, Gourheads, & Pufflings is the true tale of the everyday life of a wildlife biologist—but it's far from mundane. With humor and drama, Susan Jewell weaves vignettes of her work in the wilds from Maine to Florida, studying American Alligators, Wood Storks (gourheads), Puffins (babies are pufflings), and more. As a petite gal in a traditionally male occupation, the author deals with situations in a resourceful and captivating way. She brings the wild animals and the places they live to life and describes why biologists feel compelled to protect them.

Ms. Jewell's tales span the faunal classes of mammals, birds, reptiles, turtles, crocodilians, amphibians, and fish. In the chapter "Male Gators Like it Hot," she chronicles her experiences monitoring American Alligator nests in Everglades National Park and explains environmental sex determination for the amateur naturalist. In "Of Gopher Tortoises and Biostitutes," the author recounts working for a consulting company in South Florida that helped developers with Gopher Tortoise-laden land; the chapter ties in the Gopher Tortoise's role as a keystone species. Through the chapter "Sleeping with Rattlesnakes," Jewell touts the virtues of snakes while telling how she force-fed a rattlesnake under her care.

Ms. Jewell has studied wildlife from Maine to Florida by motorboat, airboat, canoe, airplane, helicopter, tree-climbing, scuba, and muddy feet. She previously worked for the National Audubon Society and National Park Service and is now a biologist with the U.S. Fish and Wildlife Service (since 1992). Her previous books include *Exploring Wild South Florida* and *Exploring Wild Central Florida*. Book may be ordered toll free at 877-289-2665 or from <http://www.buybooksontheweb.com> and at <http://www.amazon.com>

Book reviews from The Center for North American Herpetology, Lawrence, KS
<http://www.cnah.org>

Conservation/Legislative Update

Column Coordinators: *Becky Richendollar, North Carolina Zoo*
and *Greg McKinney, Philadelphia PA*



*This month's column was put together by
column co-coordinator Greg McKinney*

Migratory Instincts Protect Caribou Herds - Mountain caribou have a genetic nimbleness that could help them endure the threats of climate change and other challenges to their habitat. And this diversity is essential to preserve if the caribou are to survive their troubling low numbers, says a member of the research group studying the animal. The research by a team with the University of Calgary found the caribou living along the Rocky Mountains in Alberta and British Columbia are distinct from other eco-types. They appear to be a hybrid that emerged at the end of the last ice age. Some display the migratory nature of tundra-living caribou, travelling from foothills to alpine areas and back again, depending on the season. Others show the sedentary habits of woodland caribou.

Mountain caribou (*Rangifer tarandus caribou*) are part of the sub-species of woodland caribou, which are considered threatened in Alberta. The diverse nature of mountain caribou is important to safeguard, as animals with migratory instincts will better adapt to problems in their environment, said Byron Weckworth, a PhD student in the faculty of environmental design. Weckworth said that may mean changes in conservation efforts and the way oil, gas and timber industries are managed, to preserve the flexibility of mountain caribou.

"A big issue is always habitat," Weckworth said. "Are we maintaining the right amounts and the right quality for the species, in this case, the caribou?"

The research analyzed 10 years worth of tracking data and looked at DNA to draw the conclusion that some mountain caribou migrate while others stay put. Alberta Sustainable Resource Development is working to help the population levels of caribou in the province, spokesman Darcy Whiteside said. He said there are rules governing industry and human development in caribou regions that take into account factors such as migratory patterns and calving areas. But Whiteside also said caribou populations have declined during the past 100 years in many areas of Canada, even in national parks.

"We're committed to ensuring caribou remain a part of the province's landscape," he said. "We do know that it's a difficult task ahead of us. But right now, it's the stabilization which is very important to us, and then we'll look at increasing those number, of course."

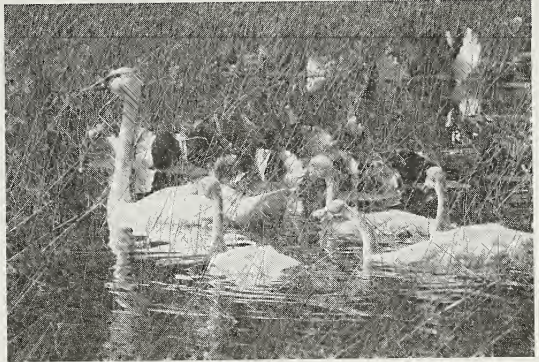
But Alberta continues to lag when it comes to protecting species at risk, says Cliff Wallis of the Alberta Wilderness Association. He argues that further development into caribou habitat must be stopped as herds are in a precarious situation.

"The Alberta government's position has been, and the industry's position has been, to try and minimize the areas that they want to protect," Wallis said. "What we're saying is we actually need to restore some of the landscape that's been lost. It doesn't mean just stopping what we've been doing, it means unroading some of the areas, unbuilding some of the industrial activity, if we really want to restore these ranges." *Source: Calgary Herald, Richard Cuthbertson, 29 January 2009*

DNR Votes to Remove Trumpeter Swans, Osprey from Endangered List - The population of trumpeter swans and osprey have rebounded so much that the Department of Natural Resources wants to remove both from Wisconsin's endangered and threatened species list. The Natural Resources Board voted 7-0 to remove the birds from the protective list, although they will continue to be protected by federal law. The measure will be reviewed by the Legislature. If it advances, as expected, the biggest effect will be that the DNR will spend less money and time monitoring trumpeter swans

and osprey in the coming years. The trumpeter swan (*Cygnus buccinator*) had been extirpated from Wisconsin by 1900. The large birds were prized for their meat and features. Artist John James Audubon favored swan quills for drawing.

“They were slow, low-flying birds and easy to hunt,” Sumner Matteson, an avian ecologist with the DNR, said after briefing board members at their monthly meeting. From 1989 to 1997, Matteson and fellow ecologist Randy Jurewicz collected 385 eggs in Alaska that were hatched in incubators at the Milwaukee County Zoo. Cygnets were primarily placed in two programs: First, at less than one week old, they were flown to marshes in northern and central Wisconsin, where college students used camouflaged floats and led the young birds to feeding areas. Second, cygnets were raised on land in Pewaukee until they were two years old and then released to wetlands in northern Wisconsin. There are an estimated 126 pairs of trumpeter swans today. The goal was to raise 20 nesting pairs by 2000. The biggest challenge for the trumpeter swan today is lead poisoning, primarily from lead shotgun shells. Birds that inhabit wetlands with lead shot frequently die, Matteson said, but the growing population has managed to outpace such poisonings.



Trumpeter Swan Brood
Photo: Donna Dewhurst USFWS

Osprey (*Pandion haliaetus*) are fish-eating birds known for their spectacular dives into water to reach their prey. There are about 484 nesting pairs of osprey. For years, the birds were devastated by the pesticide DDT. Also, osprey often select snags, or dead trees, to build their nests. Lakeshore development has reduced much of that habitat. By the early 1970s, the nesting population had dropped to fewer than 100. Aside from the prohibition of DDT, the biggest factor helping osprey has been the construction of platforms that osprey have used for nests. At least 84% of the nests are on artificial structures. Matteson said the biggest issue will be continued cooperation with utilities that construct power lines and cell phone towers. Source: Milwaukee Journal Sentinel, Lee Bergquist, 28 January 2009

Zoo Biologists Help Save Endangered Leopards - Clouded leopards (*Neofelis nebulosa*) are in danger with a declining number in the wild and only 75 in North American zoos. But three Point Defiance Zoo & Aquarium staff members are working tirelessly to ensure the long-term survival of these shy, elusive cats in the wild and in zoos.

“There is still time to save these beautiful animals if we act quickly,” said zoo general curator Karen Goodrowe Beck. Goodrowe Beck and senior staff biologist Karen Povey are traveling to Bangkok, Thailand to help develop a regional conservation action plan to protect wild clouded leopards in Southeast Asia. The first ever international Clouded Leopard and Small Felid (Cat) Conservation Summit will bring together more than 50 experts in field research, wildlife trade, and community education to develop creative solutions that address the needs of the wild cats and the people who live in the region.

After this, zoo biologist Andy Goldfarb will head to Chonburi, Thailand where he will spend nine weeks at the Khao Kheow Open Zoo overseeing its clouded leopard breeding program. Thirty-eight cubs have been born and six have been imported to the United States to improve the genetic diversity of clouded leopards in zoos since Thailand Clouded Leopard Consortium launched the breeding program seven years ago.

Goodrowe Beck said the commitment and expertise of Povey, Goldfarb and other staff will put the Tacoma zoo in a strong position to receive clouded leopard cubs from the zoo-based breeding program in the future. Point Defiance is already home to two 10-year-old clouded leopards, Raja and Josie, who live behind the scenes.

"Our zoological staff have cared for hundreds of cats, including clouded leopards, throughout their careers and are deeply committed to their long-term survival," said Goodrowe Beck.



Clouded leopard at the Toronto Zoo
(Photo: the onylsientbob_wikipedia)

The upcoming trips to Thailand will be Povey's third and Goldfarb's fifth on behalf of clouded leopards. All travel-related costs are paid through grants and donations. Goldfarb called his five stints at the zoo in Thailand "the hardest job I have ever had by far." But he said he loves the work and does it for the cats.

"When people experience these animals up close, it inspires them to work hard to save them," he said. "Saving these rare wild cats will require creative problem-solving and long-term international collaboration," said Povey, who also serves as president of Clouded Leopard Project, a local non-profit organization that is taking a leadership role in funding and organizing the summit in Thailand. *Source: Tacoma Weekly, 1-29-02*

Jackals are Disappearing from Nilgiri Forests - Jackals, a protected species, are fast disappearing from Karnataka's southwestern Kodagu region in the Nilgiris. Alarmed conservationists are now starting a study to find out what is going wrong with nature's scavengers. The region, with forests and coffee, tea and spice plantations, was once home to many jackals. Today their sightings have become rare. The NGO Wildlife Trust of India (WTI) has initiated a study in the area, covering the Nagarhole National Park and the Brahmagiri Wildlife Sanctuary, to find out why jackals are disappearing.

Of the three similar species worldwide, the Golden jackal (*Canis aureus*) is found in India. The other two are side-striped jackal (*C. adustus*) and black-backed jackal (*C. mesomelas*). Jackals are omnivorous. They hunt small mammals, birds and reptiles. Many live close to human settlements. WTI says there could be a variety of reasons for their vanishing act. One could be disease. They may also fall victim to food poisoning after eating contaminated carcasses. Jackals can be very badly affected if their prey is contaminated with pesticides. Many plantations in Kodagu, especially spice plantations, use pesticides.

Bipul Chakrabarty of WTI says: "Jackals are scavengers. They eat carcasses and that is why they are vulnerable to poisoning and disease." Jackals are important "pest control agents. By preying on rodents, among others. They are therefore an important part of the food web". Still, they are often killed as they are considered chicken thieves by poultry farmers. Rapid urbanisation is also shrinking the habitat in which they live. Chakrabarty said there was some evidence that jackals were also being poached for their fur, though this had not been established. "But we do know that except in the protected areas, their population is declining all over India. Jackals were once common in and around Delhi. Today they are confined just to the neighbouring Sultanpur and Asola Bhatti wildlife sanctuaries," he pointed out.



Golden jackal in Ngorongoro Crater Tanzania
(Photo: Lee R. Berger/Wikipedia)

The WTI study, in collaboration with the Coorg Wildlife Society and Britain's David Shepherd Foundation, will also look at how other animals are doing in the area. The Nagarhole and Brahmagiri reserves are part of the Nilgiri Biosphere in the Western Ghats, which has a rich diversity of flora and fauna.

Jackals are protected by the Wildlife (Protection) Act, 1972. The International Union for Conservation of Nature (IUCN) has listed the animal in the "lower risk" category. India's Recognition of Zoo Rules 1992 categorises them as endangered species. The golden jackal is also found in Europe and other parts of Asia. The gestation period is usually 60-63 days and it gives birth to a litter of 1-9 at a time. The pups wean at four months and reach sexual maturity between one and two years. *Source: The Hindu, 25 January 2009*

Indus Dolphins at Risk Due to Receding Water, Shortage of Feed - Rare dolphins have been found dead or injured in canals off the Indus River. Officials from the Sindh Wildlife Department (SWD) believe that receding river water and a shortage of feed might be the cause of these deaths.

"The number of dolphins in the Indus River has increased sufficiently overall, but persistent water shortage and decreasing amount of fish in the reserve are causing them to die," Hussain Bakhsh Bhagat, Sindh Wildlife Conservator, told *The News*. The Indus River dolphin (*Platanista minor*), locally known as Bhulan, is one of the rarest mammals in the world, and the second most endangered freshwater river dolphin. During monsoon rains, it migrates upstream into the smaller tributaries and downstream to the main channels in the dry season, sometimes carrying its young on its back above the surface of the water. Very sensitive to its local environment, it cannot survive for long in other waters, as the governments of China, Switzerland and Japan discovered in the seventies when taking away rare mammals from the Indus River for research purposes.

"These dolphins die within a short period after they are brought out of the Indus River," explained Bhagat. Unfortunately, when these dolphins travel for search of feed in the Indus water, they often get trapped by canals or strangled by the iron gates. According to SWD officials, this usually happens every January, which is when the canals are rotated. "In January, most of the gates of the Sukkur and Guddu barrages are closed, trapping dolphins from nearby canals," said the officials.

The SWD and Worldwide Fund (WWF) Pakistan claim to have set up dolphin conservation centres at different areas to protect the species. Attempts to preserve the dolphins date back to 1974, when a 192-kilometre stretch between the Guddu and Sukkur barrages was declared as a dolphin reserve. Even so, many still die in these waters today. Conservationists believe that the deaths of so many dolphins in different locations are indicative of an environmental disaster in the protected Indus River Dolphin Reserve, which is also a Ramsar site. *Source: TheNews Pakistan, Jan Khaskheli, 25 January 2009*

When Zoos Cut Budgets, No Species Is Safe - There's an amusing video making the e-mail rounds through the New York City environmental crowd. In it, Stephen Saunter, a press officer at the Wildlife Conservation Society and New York's Bronx Zoo, sadly addresses an employee he is about to lay off. The governor has just announced severe budget cuts at the zoo, he says, "so there's no easy way to say this ... we're going to have to let you go." The camera pans over to reveal that the just-fired employee is a porcupine. It's zoological humor — no one is firing porcupines. But the 109-year-old Bronx Zoo and other zoos and aquariums around the country are facing serious budget cuts as the state and city governments that supply much of their operating costs respond to the recession. In New York State, Governor David Paterson has called for cutting \$5 million in funding from the Zoo, Botanical Garden and Aquarium Program budget — dropping total state funding for 75 wildlife and nature centers in the state from \$9 million to \$4 million in 2009 — and eliminating it altogether in 2010. In North Carolina, state officials are withholding \$4 million in wildlife funding because of a budget shortfall; in Kansas City, Mo., municipal leaders cut the city zoo's budget by 20%. "Everyone is being forced to do some belt-tightening," says Steve Feldman, a spokesman for the Association of Zoos and Aquariums.

For the Bronx Zoo and the New York Aquarium, Paterson's proposed cuts would strike especially hard. Between them, the zoo and the aquarium stand to lose about \$3 million, which translates to 30 staff positions. New York officials say the state's environment funding — where the zoo and aquarium money comes from — will be funneled into capital projects like bridges, on the grounds that institutions like zoos can tap private funding. But at the same time, donors to the Bronx Zoo and its

sister institutions across the nation are getting squeezed by the economic crisis, leaving the zoos little to fall back on. “We thought they’d use a scalpel to cut, not an ax,” says John Calvelli, director of external affairs at the Bronx Zoo. “Where exactly are we supposed to go?”

Zoos are hardly the only organizations to be hit hard by U.S. financial straits — administrators from soup kitchens to schools are fighting for pieces of a shrinking fiscal pie. But zoos and aquariums have less flexibility as they cope with budget cuts. Live animals need to be fed and taken care of, no matter the revenue cuts. “You can’t cut back on the food an elephant eats,” says Jane Ballentine, the director of marketing at the Maryland Zoo, which has been forced to close for four additional weeks this winter. “If something needs to be fed, it’s going to be fed.” If a zoo is really struggling with a budget deficit, Feldman notes, wealthier zoos can step in to take over the care of some animals. But “that’s a last resort,” he says.

In a society that is growing increasingly citified and divorced from nature — some 80% of Americans now live in urban areas — a zoo provides one of the few chances to connect with the other species that share our planet. “This is where you go to learn about the natural world,” says Calvelli. “We’re living museums.” It would be a shame to lose any of them, even in the midst of a recession — and, frankly, who wants to be the person to tell a lion it’s being laid off? *Source: Time.com, Bryan Walsh, 17 January 2009*

Record High Manatee Numbers Counted in Florida An all-time-high number of manatees (*Trichechus manatus latirostris*) in Florida was recorded by state researchers during the annual manatee synoptic survey conducted the week of 19 January. The synoptic survey is a count of manatees over a broad area conducted by researchers who fly over areas where they expect to see the most animals. While not a precise population count, the survey provides researchers with a snapshot of manatee distribution and a minimum number of manatees in Florida waters. The Florida Fish and Wildlife Conservation Commission’s Fish and Wildlife Research Institute reported a preliminary count of 3,807 manatees statewide. A team of 21 observers from nine organizations counted 2,153 manatees on Florida’s East Coast and 1,654 on the West Coast of the state. This year’s count exceeded the previous high count from 2001 by more than 500 of the endangered animals. In both years, survey conditions were favorable for aerial observations. No survey was conducted in 2008 due to unfavorable weather conditions. Although synoptic results are not population estimates and should not be used to assess trends, the FWC is encouraged by this year’s high count.



Florida Manatee
(Photo: USGS - Siriena Project)

Survey results are consistent with population models that show the manatee population appears to be increasing in Northwest Florida, along the Atlantic Coast and on the upper St. Johns River.

Researchers have been conducting synoptic surveys since 1991, weather permitting, to meet the state’s requirement for an annual count of manatees in Florida waters. Weather and manatee behavior affect synoptic survey counts. The best conditions for the synoptic survey occur during the coldest months of the year, when manatees gather at warm water sites.

“Several cold fronts passed through Florida over a short time period, causing a large number of manatees to move to warm-water sites,” said Fish and Wildlife Research Institute biologist Holly Edwards. “Good weather conditions allowed the manatees to be easily seen and counted, contributing to this year’s high count.”

Still, 2008 manatee mortality figures released by the commission earlier this month also stood at record highs, particularly for juvenile animals. Watercraft strikes and newborn deaths were the two most common causes of manatee deaths in 2008, and the numbers for both were above the five-year average, biologists said. In December, four conservation organizations concerned about the fate of the endangered Florida manatee formally petitioned the U.S. Fish and Wildlife Service to revise the manatee’s federal “critical habitat” designations. Since the original critical habitat designations were

made more than 30 years ago, the groups say, much has been learned about manatee biology and habitat needs, and designations of critical habitat should reflect the best available science. *Source: Environmental News Service, 29 January 2009*

Emperor Penguins March Toward Extinction? - Popularized by the 2005 movie “March of the Penguins,” emperor penguins (*Aptenodytes forsteri*) could be headed toward extinction in at least part of their range before the end of the century, according to a paper by Woods Hole Oceanographic Institution (WHOI) researchers published January 26, 2009, in Proceedings of the National Academy of Sciences of the United States of America. The paper, co-authored by five researchers including WHOI biologists Stephanie Jenouvrier and Hal Caswell, uses mathematical models to predict the effect on penguins of climate change and the resulting loss of sea ice. The research indicates that if climate change continues to melt sea ice at the rates published in the latest Intergovernmental Panel on Climate Change (IPCC), the median population size of a large emperor penguin colony in Terre Adelie, Antarctica, likely will shrink from its present size of 3,000 to only 400 breeding pairs by the end of the century. What’s more, the researchers calculate that the probability of a drastic decline (by 95% or more) is at least 40% and perhaps as much as 80%. Such a decline would put the population at serious risk of extinction.

“The key to the analysis was deciding to focus not on average climate conditions, but on fluctuations that occasionally reduce the amount of available sea ice,” said Hal Caswell, who is noted for his work in mathematical ecology. Sea ice plays a critical role in the Antarctic ecosystem – not only as a platform for penguins to breed, feed, and molt, but as a grazing ground for krill, tiny crustaceans that thrive on algae growing on the underside of the ice. Krill, in turn, are a food source for fish, seals, whales, and penguins. One fluctuation and subsequent sea ice reduction in Terre Adelie during the 1970s led to a population decline in emperor penguins of about 50%.

The team led by Caswell and Jenouvrier developed a series of models to incorporate the effect of the fluctuations on the penguin life history and population growth or decline. The models used data collected by French scientists working in Terre Adelie beginning in the 1960s. Then, working with climate scientists, Jenouvrier, Caswell and their colleagues looked at IPCC climate models and found that these fluctuations are likely to become much more frequent as the climate changes over the next 100 years. Because Jenouvrier and Caswell’s models were based on fluctuations rather than smooth trends, and because different IPCC models



Emperor Penguin Colony

(Giuseppe Zibard/Michael Van Wort, NOAA NESDIS, ORA)

differ in their forecasts of future Antarctic climate, the results of the analysis incorporate uncertainty in the details of the future population growth, but the conclusions are not uncertain. “If the future behaves anything like the IPCC models predict, the Terre Adelie population will decline, probably dramatically,” said Jenouvrier

Certain predictions even suggested that the geographic range of Antarctic penguins may shrink following climate warming because the continent limits their movement south. Over the last 50 years, climate change has been most pronounced in the Antarctic Peninsula, where Terre Adelie is located. In the future, the Ross Sea—where sea ice actually has increased in recent years—may be the last sanctuary for penguins.

The WHOI research raises several questions for Antarctic researchers and those interested in conservation of penguins. One is what the march of this population toward extinction tells us about the prospects for the emperor penguin throughout its range. “This analysis focuses on a single population—that at Terre Adelie—because of the excellent data available for it. But patterns of climate change and sea ice in the Antarctic are an area of intense research interest now. It remains to be seen how these changes will affect the entire species throughout Antarctica,” said Caswell.

Another is the mechanism by which changes in sea ice affect the penguins. "The mechanisms are complex, and are an active area of research," added Jenouvrier. Yet another question is whether the penguins might adapt to changing conditions, perhaps by changing the timing of their breeding cycle. However, this does not seem to be happening. "Unlike some other Antarctic bird species that have altered their life cycles, penguins don't catch on so quickly," Jenouvrier said. "They are long-lived organisms, so they adapt slowly. This is a problem because the climate is changing very fast."

In the more immediate future, the study even might impact legal protections available for the emperor penguin. In December, the U.S. Fish and Wildlife Service issued a preliminary ruling declining to list the emperor penguin under the Endangered Species Act. Caswell said this ruling is still being evaluated and research presented in this paper will have to be considered. He added that species threatened by climate change are among the most difficult conservation problems. Improving the situation will require global actions to address a truly global environmental problem. *Source: EurekaAlert, Stephanie Murphy, 26 January 2009*

Lethal Bat Illness Spreads to Pennsylvania and New Jersey - The puzzling disease that has killed hundreds of thousands of hibernating bats in the Northeast over the past two winters has now been confirmed in two new states. The Pennsylvania Game Commission announced on 23 January that white-nose syndrome has been documented in Mifflin County, in central Pennsylvania, in a mine occupied by wintering bats. The syndrome has also recently been discovered afflicting hibernating bats in New Jersey. The endangered Indiana bat (*Myotis sodalis*) is among the several species that have been dying from the syndrome. Because of pre-existing threats to Indiana bats, and the potential for the disease to spread to bats in other parts of the eastern United States, last year conservation groups notified the federal government that they would sue unless wildlife and land-management agencies reexamined their activities potentially affecting bats and took into account the new threat of white-nose syndrome.

Said Mollie Matteson, conservation advocate with the Center for Biological Diversity: "The fact that white-nose syndrome is now confirmed in Pennsylvania and New Jersey, and appears to be spreading to other bat wintering sites in Vermont and elsewhere, should galvanize our wildlife agencies to take all precautionary measures to stop further declines in bat populations. We are looking at the potential extinction of several species of bats in the Northeast within a few years' time. There can be no more excuses for allowing activities that harm bats or destroy bat habitat. We may not be able to stop white-nose syndrome, but we can definitely stop cutting down forests, building roads, and allowing sprawl in places where endangered bats live."

The announcement came just a couple weeks after news reports that bizarre bat behavior — bats flying around in the middle of winter during daylight hours — had been observed in parts of Vermont and Massachusetts. Because the reports of winter-emergent bats came earlier this year than last, scientists have speculated that the illness — which is associated with an unusual fungus that grows on the muzzles, wings, and other parts of bats — is causing symptomatic responses among the bats sooner this winter than last.

The syndrome was first discovered in caves and mines near Albany, New York in late winter 2007. It has since spread to nearly all known bat wintering sites in the state, as well as to Vermont, Massachusetts, and Connecticut. Last year, the syndrome was suspected, but not confirmed, in Pennsylvania. Matteson says that for now, the conservationists are taking a wait-and-see attitude with regard to the response of the U.S. Fish and Wildlife Service and other federal agencies to the latest news about the bat illness.



Indiana Bat
(Photo: Andy King/USFWS)

"We know that the bats have even less margin for survival now. We need to slow or stop those activities where bats or their habitat may be harmed. We also know there are biologists desperately trying to figure out why the bats are dying, and that after eight years of Bush's anti-environment agenda, the agencies are ill-prepared to deal with a crisis of this magnitude. The Center for Biological Diversity has supported increased federal funding to help find the cause of this terrible epidemic, and that will continue. If there's a cure for this disease, it needs to be discovered very soon, before it's too late." *Source: Center for Biological Diversity, 23 January 2009*

Obama Administration Freezes Finalization of Midnight Regulations - The Obama administration announced on 20 January 2009, a freeze on publication of all proposed and final rules in the Federal Register until they are reviewed by an agency or department head appointed by the new administration. Many of the midnight regulations, such as changes to the rules implementing the Endangered Species Act and relaxation of rules restricting mountain top removal, have already gone into effect and will need to be undone by other means.

"We are grateful the Obama administration has taken this important first step towards undoing the numerous midnight regulations advanced by the Bush administration," said Noah Greenwald, biodiversity program director at the Center for Biological Diversity. "The majority of regulations threatening our environment, health and economy, however, will need to be undone by Congress, the courts or new rulemaking."

The freeze does put a halt to corporate fuel economy standards (CAFE) being developed by the administration, a rule that changed the format of the list of endangered species that attempted to redefine the extent of coverage provided to endangered species, and rules to remove protections for gray wolves (*Canis lupus*) in the northern Rockies and Great Lakes.



Grey Wolf
(Photo: Joel Sartore)

"The Obama administration now has an opportunity to develop fuel economy standards that will help address climate change and to ensure that endangered species, including the gray wolf, receive the protection they need to survive and recover," said Greenwald. *Source: Center for Biological Diversity, 21 January 2009*

Gulf Council Seeks Emergency Longline Closure to Save Turtles - Sea turtles in the eastern Gulf of Mexico could soon get more protection if the federal government approves an emergency request from a federal fisheries management agency to temporarily halt the use of fishing gear that injures and kills them. The Gulf of Mexico Fishery Management Council voted to request a temporary emergency rule prohibiting bottom longline reef fishing in waters less than 300 feet deep for the entire eastern Gulf of Mexico. While sea turtles are not the longliners' target species, the fishing gear still catches turtles in their offshore habitat on the west Florida shelf of the eastern Gulf.

Six species of sea turtles – loggerhead (*Caretta caretta*), leatherback (*Dermochelys coriacea*), olive ridley (*Lepidochelys olivacea*), Kemp's ridley (*L. kemp*i), green (*Chelonia mydas*), and hawksbill (*Eretmochelys imbricata*) - that occur in the Gulf of Mexico are federally listed as either threatened or endangered.

A 2006-2007 report from the National Oceanic and Atmospheric Administration's Fisheries Service shows that the number of loggerhead sea turtles that have been caught in the bottom longline fishery exceeded authorized levels. Loggerhead sea turtles accounted for 799 of the 974 captured turtles in the government report, more than three times the number of loggerheads the Service authorized the fishery to take in 2005. The temporary emergency rule would reduce the fishing impacts on this threatened species until the Gulf Fishery Management Council can further develop a reef fish plan amendment that will address the issue in the long term. The Florida Fish and Wildlife Conservation Commission today said it supports the council's request.

"We are extremely pleased with and supportive of the Gulf council's proposal to reduce sea turtle injury and mortality associated with this fishing activity," said FWC Chairman Rodney Barreto.

If the NOAA Fisheries Service implements the Gulf council's proposed emergency rule, it would be in effect for 180 days, and it could be extended for an additional 186 days. The Gulf of Mexico Fishery Management Council is one of eight regional fishery management councils established by the Magnuson-Stevens Fishery Conservation and Management Act for the purpose of managing fisheries in the U.S. Exclusive Economic Zone. States with voting representation on the council include Texas, Louisiana, Florida, Alabama, and Mississippi.

On 13 January, conservation groups served the NOAA Fisheries Service with a 60-day notice of their intent to sue if the agency does not act immediately to protect sea turtles from longliners in the Gulf of Mexico. The groups are seeking the kind of suspension that the council voted on Thursday to request. Even though the bottom longline fishery has far exceeded the number of turtles it is allowed to take under the Endangered Species Act, to date the NOAA Fisheries Service has declined to close the fishery while it studies options for reducing turtle bycatch. Now, under the Obama administration, its decision on the Gulf of Mexico Fishery Management Council's request could be different.

"The National Marine Fisheries Service is responsible both for managing fisheries and for protecting endangered species," said Sierra Weaver, an attorney with Defenders of Wildlife. "Our sincere hope is that the agency will take seriously its responsibility for the sea turtles threatened by longline fishing and will move quickly to protect them without the need for a court order." *Source: Environmental News Service, 4 February 2009*

Are You Moving? Help Save AAZK Some \$\$\$!

Make sure to notify AAZK of your change of address. Not only do you not want to miss a single AKF issue, but it costs AAZK about a \$1.00 for every AKF that is returned by the Post Office as undeliverable! This is money that could be better spent on AAZK's projects and programs. So, PLEASE take the time to notify us when you relocate.

**Call: 785-273-9149 or you can email change of address information to:
aazkoffice@zk.kscoxmail.com< Please put "Address Change" in the subject line. You
may also send in a change of address from the AAZK website (www.aazk.org)**

See the Reminder Bar on the right side of the Homepage.

AAZK Membership Application (Please Print)

check here if renewal []

Name _____

Email _____

Mailing Address _____

City _____ State/Province _____ Zip/Postal Code _____ Country _____

☐ **U.S. Members**
\$40.00 Professional
Full-time Keepers

☐ **\$35.00 Affiliate**
*Other staff & volunteers, or
those interested in the profession
but not associated with a zoo or aquarium*

☐ **\$25.00 Student**
*Must supply a copy of current student
ID at time of application*

☐ **\$65.00 or up - Individuals**
Contributing/U.S.

☐ **\$150.00 or up**
Institutional/U.S.
(requires Board approval)

☐ **\$125.00 Commercial Members**
(i.e. Animal-related food & supplies)

☐ **Canadian Members**
\$40.00 Professional
Full-time Keepers

☐ **\$40.00 Affiliate**
*Other staff & volunteers or
those interested in the profession
but not associated with a zoo or aquarium*

☐ **\$25.00 Student**
*Must supply a copy of current student
ID at time of application*

☐ **\$65.00 or up - Individuals**
Contributing/Canada

☐ **\$150.00 or up**
Institutional/Canada
(requires Board approval)

☐ **Library Only** *Available ONLY to public &
\$40.00 Library university libraries (in U.S.)*

☐ **International Members**
\$55.00 International *All members outside U.S. & Canada regardless of category*

Zoo Affiliation (if any) _____

Zoo Address _____

Title/Work Area _____

☐ **My check is enclosed (AAZK, Inc.)**
(U.S. Funds Only)

☐ **Please charge my credit card**

MASTERCARD VISA Card # _____ - _____ - _____ - _____

Name on card _____ Expiration date _____
(Please PRINT)

Signature _____

Mail this application to: AAZK Administrative Offices, 3601 S.W. 29th, Suite 133 Topeka, KS 66614-2054.
Make checks/money orders payable to AAZK, Inc. Must be in U. S. FUNDS ONLY. Membership includes a
subscription to *Animal Keepers' Forum*. The membership card is good for free or discounted admission to many
zoos and aquariums in the U.S. and Canada.

You may also join or renew your membership at www.aazk.org



AMERICAN
ASSOCIATION
of ZOO KEEPERS

3601 S. W. 29th St.
Suite 133
Topeka, KS
66614-2054
U.S.A.

Return Service Requested

*"Dedicated to
Professional Animal Care"*

Non-Profit Organization
U.S. POSTAGE PAID
Topeka, KS
Permit # 646

SMITHSONIAN INSTITUTION LIBRARIES



3 9088 01463 3614



Animal Keepers' Forum
35th Anniversary
1974 - 2009

*****MIXED AADC 66340
9/10 GRP 1
NATIONAL ZOO LIBRARY TRAY 9
VISITORS CENTER - MRC 551
P.O. BOX 37012
WASHINGTON DC 20013-7012